THE

AMERICAN GAS-LIGHT JOURNAL.

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

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WHY IS NOT THE PAY OF THE ARMY INCREASED?

Congress must raise the pay of the regular army at once. It was always too low—it is now beyond endurance- too niggardly. We refer to the regular army, because those gallant fellows, who have devoted their lives to the service, know no other, and are fitted for no other profession. The pay of the Artillery and Infantry officers is, under the new law, as follows:

Rank.	Pay per month.	Rations.	Total per month.	Remarks.
Colonel.....	95	54	149	Horses kept by Gov't
Lieut. Colonel.	80	45	125	" "
Major.....	70	36	106	" "
Captain.....	60	36	96	
First Lieut.....	50	36	86	
Second Lieut..	45	36	81	

Now, it will not require a mathematician to discover how entirely inadequate those rates of income are to officers of the army even in time of peace in barracks—nor how much more so, when obliged to be on the move constantly, as at present.

No gentleman can get suitable accommodations for himself, wife, and child, at a decent boarding-house, for less than $25 a week, or $100 a month—that is, for food and shelter alone. Where, then, is the provision for an extra baby, for clothing, fuel, lights, omnibus and ferry fare, and the thousand little sundries more mighty in the aggregate than the first and most prominent expenses?

And then how frightfully every thing has increased in price lately! With the Government paper-money at a depreciation of thirty-five per cent.—the dollar of 1860 bringing only 65 cents worth in 1862—where is the provision to meet this emergency?

The American officer is by nature, instinct, and education a gentleman. He should be treated by his Government as such—he should be placed at the head of his command with a light heart, at least as to his reasonable family expenses. Many noble fellows are now weighed down with the burden which an inconsiderate Government have placed upon them. Will not some energetic member of Congress lift this burden? Mr. Harris, will not you?

TO THE ARMY AND NAVY.

The subscription to the AMERICAN GAS-LIGHT JOURNAL is but $3 per annum. It will be found full of interest to both branches of the service, containing information of a personal character not possessed by the daily papers. The JOURNAL has many readers in both branches of the service who have been with us since its commencement.

Enclose three dollars by mail addressed as follows:

THE AMERICAN GAS-LIGHT JOURNAL,
39 Nassau Street,
New York City.

We will risk its safe receipt, and send the JOURNAL for one year, changing the address with the station of the subscriber.

ILLNESS OF COL. HOWARD.—Col. W. A. Howard of the Marine Artillery, is now at the New York Hotel very ill with malaria fever, caught in the marshes of the Dismal Swamp. Col. Howard left here in December last, and has been ten months in steady service. He is a brave fellow—always fights in white kids, and is not afraid of the devil himself. We hope the Colonel is not destined to see his lordship very soon, but it looks like it. He is very ill.

DEATH OF SAMUEL S. DAUCHY.—Mr. Samuel S. Dauchy, the Secretary of the Troy, N. Y., Gas-Light Company, died in that city on the 27th of October last.

TO ENGLISH SUBSCRIBERS.

The subscription price of the AMERICAN GAS-LIGHT JOURNAL is

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We find it impossible to transact our business in England satisfactorily through agents, especially as we desire to supply the JOURNAL at a lower price than they can afford to do it.

Send us, therefore, a post-office order for *twelve shillings*, enclosed as above, and this JOURNAL will be forwarded regularly through the mail, *post paid.*

PRIZES FOR OUR GALLANT NAVY.

The following is a correct list of the vessels thus far sold and condemned. No distribution of any part has yet taken place, although the cases of the Brooklyn, Huntsville, Mercedita, Itasca, and South Carolina are before the Department, and due notice will be given in the AMERICAN GAS-LIGHT JOURNAL of the payment of the money. The Union's prize-money for the rebel Hattie Jackson will soon be paid.

UNITED STATES DISTRICT COURT, SOUTHERN DISTRICT OF FLORIDA.

The Admiralty Court at Key West has settled the costs, expenses, duties, &c., in the following cases, and ordered the net proceeds to be paid into the Treasury of the United States for distribution between the United States and the captors, under the direction of the Secretary of the Navy. One-half of the net proceeds is to be divided into shares and paid to the captors, as provided by law:

NAME.	CAPTURING VESSEL.	Net Proceeds.
Schr. Emma.....	Str. Connecticut.....	9,282 04
Schr. Olive Branch..	Bark Kingfisher.....	5,600 16
Schr. Isabel.....	Str. Montgomery.....	4,192 72
Sloop Margaret.....	Str. Sciota.....	3,315 51
Schr. Eugene.....	Str. Owasco.....	26,296 11
Schr. President.....	Str. Owasco.....	11,117 98
Steamship Magnolia.	Brooklyn, Huntsville, South Carolina and Mercedita.....	167,404 16
Schr. Lion.....	Bark Kingfisher.....	7,479 86
Schr. Eugenia Smith.	Brig Bohio.....	2,864 00
Schr. Wm. Mallory..	Str. Water Witch.....	5,968 90
Schr. Anna Belle....	Bark Pursuit.....	5,388 37
Schr. Grace E. Baker.	Str. R. R. Cuyler.....	14,368 27
Sloop Octavia.....	Mercedita and Sagamore.....	611 38
Schr. Rose.....	Mercedita and Sagamore.....	7,019 48
Schr. H'y Travers...	Str De Soto.....	6,506 12
Schr. R. C. Files	Str. Kanawha.....	33,234 21
Schr Newcastle.....	Brig Bainbridge.....	32,284 73
Schr. Adeline.....	Str. Connecticut.....	2,844 05
Schr. W. C. Bee.....	Str. Santiago de Cuba.....	28,414 25
Schr. Princeton....	Str. Susquehanna.....	2,953 35

Total amount paid by the Marshal into the United States Treasury, $376,595 65.

In the following cases appeals have been taken, and the prize money, although paid into the Treasury, less the expenses, cannot be divided until after a decision of the higher court:

Bark Pilgrim. Vessel and cargo restored by court; appeal taken by District Attorney as to the vessel. Sale of vessel (interlocutory).....	605 00
Schooner Floride. Vessel and cargo condemned; appeal taken by claimants. Amount of sales.....	9,589 49
Schooner Cora. Vessel and cargo condemned; appeal taken by claimants. Amount of sales.....	32,097 52
Steamship Circassian. Vessel and cargo condemned; Appeal taken by claimants. Amount of sales $61,949 95; appraised value of cargo yet unsold, $197,000; appraised value of vessel, yet unsold, $107,000: total.	304,000 00
Schooner Jane. Vessel and cargo condemned; appeal taken by claimants. Amount of sales.....	2,918 84
Schooner Andromeda. Vessel and cargo condemned; appeal taken by claimants Amount of cargo sales.	124,727 06
Vessel appraised and taken by claimants.....	3,000 00
Schooner Venice. Vessel and cargo restored; appeal from the decision of the Court taken by the District Attorney. Vessel and cargo appraised at.....	30,000 00
Schooner Orion. Vessel condemned; orders for further proof in regard to cargo. Appraised value.....	4,000 00
Schooner Baigorry. Vessel and cargo condemned; appeal taken by claimants. Cargo, 250 bales of cotton, yet unsold.....	—
Amount sales of vessel.....	2,379 87
Schooner Lucy. Vessel and cargo condemned and sold. Appealed. Amount of sales.....	4,133 81
Schooner Brilliant. Mexican. Appeal taken by the United States. Value about.....	4,000 00

The following cases have been condemned and a portion of the property sold:

Steamer Swan. Cargo, 1,000 bales of cotton. Sold for	261,868 85
Vessel appraised at.....	25,000 00
Steamer Reliance. Cargo, 237 bales Sea Island cotton, yet unsold. Vessel appraised at.....	15,000 00
Steamer Union. Cargo, 350 bales upland cotton, yet unsold. Vessel apraised at.....	5,000 00
Steamship Columbia. Cargo, munitions of war (among which is one complete brass battery of rifled field-pieces) dry goods, tea, coffee, &c. Estimated value of vessel and cargo.....	275,000 00
The vessel to be turned over to the navy on appraisement; the ordnance and ordnance stores to the army.	—
Schooner Ida. Vessel and cargo sold. Total amount of sales.....	7,821 16
Schooner Julia. Vessel sold for $256 50. Cargo, 97 bales cotton. Sent to New York for sale.....	—
Schooner Uncle Mose. Vessel sold for $183 74. Cargo, 113 bales of cotton. Sent to New York.....	—
Schooner William. Vessel and cargo (405 bales of cotton) sent to New York for sale.....	—
Schooner Victoria. Vessel sold for $120. Cargo, 149 bales of cotton. Sent to New York for sale.....	—
Schooner Agnes. Vessel sold for $1,322 45. Cargo, 77 bales of cotton and 40 bbls. rosin. Sent to New York for sale.....	—
Schooner Lavinia. Vessel and cargo, 100 bbls. turpentine, yet unsold. Cargo sent to New York for sale..	—
Schooner Concha. Vessel and cargo yet unsold.....	—
Sloop Elizabeth. Vessel sold under interlocutory order. Case not heard for one year, no witness havink appeared. Cargo, 46 bbls. molasses; disposed of in the same manner.....	—
Bark ——. Captured after landing cargo of slaves on coast of Cuba. Specie and amount sales of vessel.	8,471 14
Schooner Magnolia. Vessel and cargo sold. Case settled by court, but amount not yet paid into the Treasury. Amount of sales.....	41,731 61
Schooner Curlew. Vessel and cargo sold. Case settled by court, but amount not yet paid into the Treasury. Amount of sales.....	6,902 00
Brig Naham Sitson. Sold. Returns made to the Treasury. Amount of sales.....	2,710 68
Schooner Aristides. Three-eighths of vessel condemned and sold. Remainder restored. Amount of sales...	125 00
Schooner Fashion. One-third of vessel and cargo condemned and sold. Two-thirds restored. Amount of sales.....	883 75
Schooner Beauregard. Sold. Amount paid over to the United States.....	2,146 67
Steamship Adela. Case heard and awaiting further proof. Value of vessel, $115,000. Cargo, $10,000. Total.....	125,000 00

LIST OF VESSELS RESTORED BY ORDER OF THE COURT, AND NO APPEAL TAKEN FROM ITS DECISION BY DISTRICT ATTORNEY.

Schooners Will o' the Wisp and Victoria No. 1; bark H. E. Spearing and Spanish bark Teresita; schooners C. P. Knapp and Zeland. Value of these vessels not included in the estimate.

Total amount of sales of prize property.....	$865,028 88
Estimated value of property still in the hands of the United States Marshal.....	1,170,500 00
Total..	$2,035,520 88

NUMBER OF CAPTURES.

Steamships.....	7	Schooners.....	44
Barks.....	4	Sloops.....	3
Brigs.....	1		
Total.....			59

COL. T. W. PARMELE.—Our gallant friend, the son-in-law of Col. Charles Roome and late Major of the 37th New York, is now Colonel of the 5th Metropolitan. If we were in the fighting line we should want to "soger arms" under Col. Parmele, a brave, chivalric, reliable officer, who is now in his element and will do good service. We think highly of him, because we know him well.

WATER-WORKS OF AMERICA.

BOSTON, MASS.

Through the courtesy of James Slack, Esq., Engineer of the Cochituate Water Board of Boston, Mass., we have received the last annual report of the board, from which we abstract the following:

The expenditures and receipts on account of the Water Works to January 1, 1862, were as follows:

Amounts paid by the original Commissioners, and by the Water Board from the time the Works came under the control of the latter.....		$5,580,860 64
Sundry payments by the city and discount and interest on loans.....		3,682,295 65
		$9,263,156 29
From which there should be deducted sundry credits by the city, and amounts received for water rates.		3,138,835 65
		$6,124,320 64

Leaving the actual cost of the Works on January 1, 1862, the sum of $6,124,320 64.

The receipts for water used in the year 1861 was $342,138 75, being an increase over the income of the previous year of more than thirty thousand dollars, and being about five and one-half per cent. on the cost of the Works, as above stated.

The assessments for the year 1862, payable in January, amount to $298,755 19.

The estimated amount of income from sales of water during the year 1862 is $375,000 00.

There has been drawn from the treasury by the Board, during the year, the sum of.....$73,977 29

Of this, there was drawn for the new main pipe.....	$334 76	
For raising the pipes on Tremont and Dover streets....	601 50	
For laying pipe in Beacon street.....	506 78	
For extension of the works..	38,615 50	
		40,053 54
Leaving as the ordinary expenses of the year.....		$33,918 75

The increase of expense for the year was caused by repairs upon the line of pipe to East Boston, and upon Beacon Hill Reservoir, which together amounted to the sum of $4,200.

The embankments, culverts, waste-weirs, and bridges connected with the aqueduct in the Western Division, have all been thoroughly repaired during the year, and are now in good condition.

The Superintendent of this division has several times thoroughly examined the interior of the aqueduct, and on one occasion was accompanied by members of the Board.

In August last the interior received a thorough cleansing throughout its whole extent. No new cracks were discovered, but the Superintendent reports that some of the old ones have enlarged. One in Brighton will require particular attention, but it is obvious that repairs of this sort are attended with great difficulty, as the Brookline Reservoir is not large enough to keep the city supplied while the water is shut off from the aqueduct for the purpose of repairing the same.

EASTERN DIVISION.

The usual amount of iron pipe has not been laid in this disvision, owing to the limited amount of building in the city, while the repairs have been more than usual. At Chelsea creek it was discovered that the worms had destroyed the wood-work that supports the pipes, to a considerable extent, and immediate repairs were deemed necessary, and were made. At Warren Bridge a new outside fender has been put on the entire length, and made secure.

Repairs on the Beacon Hill Reservoir were commenced, but have been postponed on account of the difficulty of procuring cement. They will probably be resumed in the spring.

The aggregate length of pipes laid from the commencement of the Works, to January 1, 1862, is over one hundred and thirty-one miles.

The line of pipe to East Boston has been repaired. The bridges and the box across the creek between Chelsea and East Boston were very much decayed, and particular attention is called to the subject of the East Boston supply. If this pipe across the creek should give out from any cause, the citizens of this portion of the city would be wholly deprived of water, for the pipe which is under water cannot be repaired. It is recommended that another pipe be laid across Meridian-street bridge, of a larger size than the present one.

LAKE COCHITUATE.

By the act of the Legislature of the Commonwealth of Massachusetts of 1860, (ch. 184,) the city was authorized to raise the dam at the outlet of Lake Cochituate to the height of ten feet above the floor of Knight's flume (so called). In accordance with this act the dam was raised, and in the judgment of the Board, the greatest capacity of Lake Cochituate for the supply of water has been reached. In case the supply is insufficient, recourse should be had to other sources, which may or may not be connected with this lake. To raise the lake any higher will require legislative action, and would be attended with such expense, and with difficulties so great and so numerous, that the Board are of the opinion that it will be a mistaken policy to attempt it.

The Board have visited the lake and made a careful examination, with the view of obtaining more water; and after the most careful consideration of the whole subject, decided to connect Dudley Pond with the lake by an iron pipe about eight hundred feet in length. It was thought that a portion of the distance could be tunnelled, but upon examination this was found impossible, there being so much coarse gravel; and it was found necessary to dig a trench, the deepest part of which is sixty feet. The estimated cost of this connection is less than $14,000.

WASTE OF WATER.

With this addition to the source of supply there ought to be water enough for Boston without any additional expense, and the Board are confident there would be, were it not for the wasteful use of the water in the city. This has been a topic of discussion in the various Water Reports for several years. The present Board have adopted energetic measures, by the aid of the police, in preventing this evil, and these measures have been attended with marked success. At the same time, the only efficient remedy must be found in the citizens themselves in the use of water, and in giving information of any wasteful use by others, or by the general adoption throughout the city of water-meters, and an entire change in the assessment and collection of water rates.

WATER-METERS.

The Board are satisfied that some methods of using the water, heretofore allowed, are highly objectionable, and should be changed at once. One of these is the use of hopper water-closets. In order to test this manner of using the water, a meter was attached to a pipe that supplied five hopper water-closets at the Boston and Maine Railroad station, and in twenty-two days the meter indicated 543,187 gallons as the quantity consumed, or 24,690 gallons per day, which, at the tariff-rate of two cents for each one hundred gallons per day for three hundred and sixty-five days, would amount to $1,802 37. The amount actually charged in the tariff now adopted for five hopper closets, in 1861, was $25!

The Board have not hesitated to adopt a rule that no more water shall be supplied to hopper closets made on and after January 1, 1862.

The Board also caused two meters to be attached to the factory of Messrs. Grover & Baker, with the following results: In thirty-five days, the meter that supplied the engine of twenty-eight horse-power consumed 124,657 gallons, or 3,561 gallons per day, which, at the tariff-rate of two cents for each one hundred gallons for one year, amounts to $213 66. The amount paid for this engine in 1861 was $217 76.

The meter that supplied nine water-closets and six sinks, in the same establishment, indicated in thirty-five days 698,565 gallons to have been used, or 19,959 gallons per day, which, at the tariff-rate of two cents for each one hundred gallons for one year, amounts to $1,197 36. The amount actually paid for these closets and sinks for the year 1861 was $80!

A meter was placed during the year in the house of the President of the Board, in Chesnut street. The family consisted on an average of six persons, and the quantity of water used was the same as before the meter was placed there; that is, no change was intentionally made in this respect. The result was, that for two hundred and forty-five days the quantity of water used was 20,670 gallons,—an average of eighty-four gallons per day, or 30,660 per annum, which, at the tariff-rate of six cents per one hundred gallons, amounts to $18 39. The rate charged and paid for this house was $21. *From which it appears that the occupant actually paid more by the rate than he would have paid by actual measurement.*

CHEAPER METERS NECESSARY.

These results speak for themselves, and show that some radical change in this enormous disparity between the amount of water used, and payed for, is desirable; and it is quite certain that the most just, satisfactory, and equitable method of charging for the water would be by actual measurement, so that each citizen may pay for just the quantity he uses. Hence many are ready to advocate the immediate introduction of water-meters over the whole city. Perhaps this may be the result in time. But there are practical difficulties in this matter that deserve serious consideration before any such radical change is made; and such a plan would require the expenditure of something like half a million of dollars at the present cost of water-meters. In certain cases, however, where a measurement of water seemed absolutely indispensable, the Board have caused meters to be introduced; and during the year they have procured forty-two meters, and have expended about three thousand dollars for this purpose.

THE CHANGE OF TARIFF IN REGARD TO HOTELS SUSTAIND BY THE COURTS.

The Board state that the change which was made in the tariff in regard to hotels has been sustained by a decree of great importance made by the Supreme Judicial Court. The case was brought before the Court by the proprietor of the Parker House, in a bill in equity to restrain the city of Boston from cutting off the supply of Cochituate water therefrom, or otherwise enforcing against the plaintiffs the water rates assessed upon them in the year 1859. The facts in the case were that, under the provisions of the city ordinance, the Water Board and Registrar put into a portion of the hotels of the city, including that of the plaintiffs, a water-meter, for the purpose of determining the quantity of water used therein; that the water used in plaintiffs' hotel exceeded ten thousand gallons a day; and the Water Registrar, under the direction of the Water Board, made an assessment thereon, for the quarter ending December 31, 1859, at the rate of two cents for each one hunderd gallons; that the amount of the assessment so made was $206 19; while, if made according to the provisions of the city ordinance, applicable to hotels into which no meters have been put, it would have been only $57 40, and that the plaintiffs were notified, December 27, 1859, that unless the amount assessed was paid within three days the water would be cut off.

The counsel for the plaintiffs contended—1. That the power to fix the price and rents of water was in the City Council alone, and could not be delegated to the Water Board or any other city officer. 2. That the citizens using water had a right to have the judgment and discretion of the City Council upon the price to be paid. 3. If the ordinances were otherwise within the authority of the City Council, they were uncertain, unreasonable, and therefore void. 4. But the plaintiffs were charged several times as much under these provisions as under the price fixed by the City Council. 5. Hotel-keepers using the same quantity might, under these provisions, be charged at rates differing as one to four, at the will of the Water Board or Water Registrar. 6. Even if the ordinance was valid, this specific water rate should have been assessed by the Registrar and not by the Water Board. 7. It should have been assessed on the last of January, for the year, and not quarterly.

In the elaborate opinion of the Court all these points were overruled, and it was decided that, upon a proper interpretation of the provisions of the statutes and ordinances bearing upon the subject, none of the objections urged by the plaintiffs against the proceedings of

the Water Board in fixing the price or rent to be paid for water taken by them could be sanctioned. Judgment was accordingly rendered for the city. As this was a test case, the other hotel proprietors who had refused to pay the rates assessed, subsequently paid them, amounting to $9,526 50.

AN INCREASE IN THE WORKS NECESSARY FOR AN INCREASE OF POPULATION.

Reference is made to the probable future increase in the population of the city, and it is suggested that an increase in the future supply will, in that event, become a necessity. The present works, although wholly inadequate to the present wants of the city, will not bear a much greater demand than that now made upon them; and rather than injure them by unduly taxing their powers, means should be taken to be provided with other works more suitable to the possible demands of the future.

LEAKS.

Of leaks that have occurred in pipes of four inches in diameter and upwards, eighty-five were caused by the loosening of lead in the joints, seven by defective pipes, seven by defective stop-cocks, eight by settling of earth, two by frost. Total, one hundred and nine in pipes of four inches and upwards.

Of the leaks that have occurred in service and two-inch pipes are as follows: One hundred and twenty-two were caused by the settling of earth, thirty-eight by stiff connections, nineteen stopped by rust, twenty by frost, forty-one by defective pipes, twenty-six by defective couplings, sixty four stopped by fish, fifteen by defective cocks, eleven gnawed by rats, twelve struck by picks, fourteen defective joints, nine by digging drains, four stopped by gasket, three by cocks blowing out, one by tenants. Total, three hundred and ninety-nine in service and two-inch pipes, showing a decrease in the whole number of leaks for the past year of eighty-four.

The following table exhibits the yearly revenue received from the sales of Cochituate water, since its introduction into the city, October 25, 1848:

From October 25, 1848, to January 1, 1850			$72,043 20
" January 1, 1850,	"	1851	98,867 90
" " 1851,	"	1852	161,299 72
" " 1852,	"	1853	179,486 25
" " 1853,	"	1854	196,352 32
" " 1854,	"	1855	217,007 51
" " 1855,	"	1856	266,302 77
" " 1856,	"	1857	282,651 84
" " 1857,	"	1858	259,328 83
" " 1858,	"	1859	302,409 73
" " 1859,	"	1860	314,808 97
" " 1860,	"	1861	334,544 86
" " 1861,	"	1862	365,323 46
			$3,079,927 36

STATEMENT SHOWING THE NUMBER AND SIZES OF WATER-METERS NOW IN USE, AND WHERE APPLIED, TO JANUARY 1, 1862.

	SIZES OF METERS.			
	½ inch	1 inch	2 inch	3 inch
Revere House		3		
Parker House		4		
American House		2		
Adams House	2			
Coolidge House		4		
Marlboro' House		1		
Tremont House		4		
United States Hotel		3		
Winthrop House		2		
Bromfield House	1			
City Hotel	2			
Sailors' Home	1			
Mariners' House	1			
Pearl Street House		1		
Boston Hotel	1			
Young's Hotel		2		
New England House		1		
Hotel de Pelham	2	1		
I. Adams (boarding house)	1			
Boston Sugar Refinery				1
South Boston Sugar Refinery			2	
Boston and Worcester Railroad Company		2		
Boston and Maine Railroad Company	1	1	1	
Old Colony Railroad Company		2		
Fitchburg Railroad Company		1		
Eastern Railroad Company		4		
South Boston Gas Company	1			
East Boston Gas Company		1		
Norway Iron Company, wire manufactory		2		
J. Trull & Co., distillery		1		
J. M. Barnard, distillery		1		
C. Bowman, distillery		2		
Bay State Rolling Mill		1		
Hodges & Silsbee, distillery	1			
Henry N. Hooper & Co., foundry		1		
Luther Felton, distillery		1		
Henry Souther, brewery		1		
Oriental Oil Company		1		
William Carleton, lamp manufactory	3			
Millitt & Smith, sugar house		1		
Boston Crystal Glass Co., glass manfy	1			
Boston Gasometer (Charles Street)		1		
Dexter, Lambert & Co., tassel factory		1		
Sanborn, Richardson & Co., pipe manfy	1			
Grover, Baker & Co., sewing machines		2		
Lee, Woodman & Co., oil mill	1	2		
Graves & Hoyt, distillery	1	1		
Cunard Steamship Company				1
J. H. Hazelton, paper manufactory	1			
Chelsea Ferry Company				1
East Boston Ferry Company			1	
Chickering & Sons, piano manufactory		3		
M't Washington Glass-Works, glass manfy		1		
American Grist Mill		1		
W. K. Lewis, pickle manufactory	1			
W. H. Davis, pickle manufactory	1			
J. B. Hamblen, pickle manufactory	1			
Stephen Jenny distillery	1			
Stephen Jenny, oil factory	1			
Ambrose Louis, chemicals	1			
W. D. Philbrick, chemicals	1			
Shawmut Oil Company	1			
Downer Kerosene Oil Company			1	
Henry Howland, distillery		1		
John Felton, distillery		1		
Ketridge & Co., turpentine factory		1		
Total	30	66	5	3

MEMBERS OF THE BOARD.

President,

EBENEZER JOHNSON.

SAMUEL HALL, SAMUEL HATCH, GEORGE P. FRENCH, JABEZ FREDERICK, GEORGE DENNIE, L. MILES STANDISH.

City Engineer,

JAMES SLADE.

CONSUMPTION OF WATER.—DAILY AVERAGE NUMBER OF WINE GALLONS DRAWN FROM THE BROOKLINE RESERVOIR.

MONTHS.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.
January	10,695,200	9,702,700	12,069,000	15,089,000	12,160,000	14,512,000	17,862,000	21,106,769
February	10,634,200	10,349,800	12,79[illegible],000	14,175,000	14,399,000	14,769,000	18,90[illegible],000	20,804,131
March	9,582,100	10,125,600	12,5[illegible],000	13,941,000	14,154,000	14,480,000	15,409,000	19,456,344
April	8,738,500	8,540,000	10,833,000	12,451,000	13,465,000	13,760,000	13,621,000	17,151,503
May	9,685,300	9,103,800	10,378,000	12,414,000	11,423,000	11,892,000	14,790,000	16,687,842
June	11,145,200	9,984,400	11,221,000	12,504,000	10,867,000	11,639,000	17,[illegible]38,000	17,231,984
July	10,613,800	11,053,600	13,167,000	13,551,000	13,621,000	13,219,000	17,239,000	18,897,808
August	10,928,100	11,120,800	12,664,000	14,077,000	13,141,000	12,704,000	19,297,000	18,272,865
September	9,712,400	11,710,800	11,552,000	12,693,000	12,745,000	12,389,000	17,957,000	18,088,259
October	8,769,800	10,771,200	11,891,000	10,864,000	12,969,000	12,026,000	16,938,000	17,987,128
November	8,050,200	10,383,200	11,091,000	11,372,000	12,143,000	12,715,000	16,862,000	16,644,076
December	10,597,600	11,207,200	12,284,000	11,241,000	13,075,000	14,586,000	19,151,000	15,976,362
Average for year	9,902,000	10,346,300	12,048,600	12,726,000	12,847,000	13,175,600	17,238,000	18,189,304

LAMP CHIMNEYS IN 1660.—Samuel Pepys mentions in his quaint Diary, Vol. I., p. 116, his first sight of lamp chimneys. We give his own words:—

"October 24, 1660.—Mr. Moore tells me, among other things, that the Duke of York is now sorry for his *amour* with my Lord Chancellor's daughter, who is now brought to bed of a boy.

"To Mr. Lilly's, where not finding Mr. Spong, I went to Mr. Greatorex, where I met him, and where I bought of him a drawing-pen; *and he did show me the manner of the lamp-glasses, which carry the light a great way, good to read in bed by, and I intend to have one of them;* and we looked at his wooden jack in his chimney that goes with the smoake, which is indeed very pretty."

What would Pepys say if he could see one of Dithridge's patent flint glass lamp-chimneys?

MORE DERIVATIVES FROM NAPHTHA.—At a recent meeting of the Chemical Society, London, Mr. Greville Williams, F. R. S., read a paper, in which he states that he had succeeded in obtaining the iodides of several alcohol radicals from Boghead naphtha. Acids, alcohols, ethers, aldehydes, alkaloids, &c., may now be produced from naphtha almost to infinity. Mr. Williams has already procured the iodides of amyle, œnanthyle, capryle, and the new alkaloids œnanthylamine and pelargonamine.

EXTRA PAY TO ENGINEERS.—The volunteer engineer soldiers are by a recent act of Congress entitled to the same pay as the regular engineers. Mr. MURRAY will obtain for any who have received only infantry pay their full allowance, on being informed of the facts of the case. See his advertisement in this JOURNAL.

THE COLOR PRODUCTS OF COAL—MAUVE AND MAGENTA.

A Lecture delivered before the Royal Institution of England.

BY A. W. HOFFMANN, L. L. D., F. R. S.

(*Concluded from page* 133.)

Magenta is one of the fancy names given to the splendid crimson which is likewise generated from aniline by the action of oxidizing agents. This substance was first observed in purely scientific researches, and more especially in the action of tetrachloride of carbon upon aniline. To a French chemist, M. Verguin, the merit is due of having for the first time obtained this substance on a large scale; he produced it by the action of tetrachloride of tin on aniline. Numerous other processes were subsequently suggested, among which treatment of aniline with chloride or nitrate of mercury with arsenic acid, and many other substances may be mentioned. Magenta, often called fuchsine, roscine, &c., soon became an article of large consumption. A great impetus to this new branch of industry was given in France by Messrs. Renard and Franc, who were the first to manufacture the new article on a commercial scale; in this country, very soon afterward, Messrs. Simpson, Maule and Nicholson engaged with great spirit in the manufacture of this splendid dye, the production of which has attained already colossal proportions. To Mr. E. C. Nicholson more especially belongs the credit of having developed this new industry to an unprecedented degree of perfection.

Before proceeding, however, let me show you the formation of magenta by experiment. Among the many processes which I might adopt for this purpose I select the action of corrosive sublimate upon aniline, not because I consider this process superior to the others—it is, in fact, inferior to many—but because it is, perhaps, the best adapted for a lecture experiment. This white powder is chloride of mercury (corrosive sublimate); a small portion of this salt I mix in a test tube with perfectly colorless aniline. Let us stir the mixture with a glass rod until it is converted into a perfectly homogeneous liquid paste. This paste is still colorless, but on gently heating it by a gas burner it instantaneously assumes a splendid crimson of the greatest intensity, a single drop of the liquid being capable of deeply coloring a large beaker filled with alchohol.

In all the processes which convert aniline into coloring matters, a considerable number of secondary products are generated, which it is rather difficult to separate from the principal product of the reaction. These difficulties have been most perfectly overcome by Mr. Nicholson, who has succeeded in obtaining magenta in a state of absolute purity. Chemists have thus been enabled to analyze this substance, and to lift, at all events, the corner of the veil which still covers the mysterious formation of the colored derivatives of aniline.

In the pure state, magenta is a fine crystalline, and, remarkably enough, perfectly colorless, or only slightly tinted body, which is represented by the formula—

$$C_{20}H_{21}N_3O = C_{20}H_{19}N_3,H_2O$$

Rosaniline (this is the name by which chemists designate the colorless body) is a base, or ammonia derivative, which forms a series of splendid salts. With hydrochloric acid, for instance, it produces a beautifully crystalline salt of the formula—

$$C_{20}H_{19}N_3,HCl.$$

It is in the state of saline combination that rosaniline acts as a crimson dye. Into this shallow porcelain dish I have thrown a few crystals of rosaniline, which at a distance you scarcely perceive; I now pour upon these crystals a small quantity of acetic acid, when, on gently heating the dish, the crimson color instantaneously appears. But it is only in solution that even the salts of rosaniline are crimson colored; on slowly evaporating their solution, the red color entirely vanishes, and a splendid green crystalline substance remains, presenting in an extraordinary manner the beautiful metal luster which distinguishes the wings of the rose beetle. Together with all the products involved in the manufacture of aniline and aniline dyes, my friend Mr. Nicholson has placed before you the finest series of rosaniline salts which has ever been produced; and not content with this display, he was

kind enough to send us a specimen of acetate of rosaniline, such as no mortal eye has ever seen before. The specimen may be literally called the "crown of magenta." Crowns are always expensive articles, and the cost and trouble of getting them are often greater than their actual value. This remark applies in a measure to the crown of magenta. For the benefit of those who are fond of big figures—and who is not a little afflicted with this weakness?—I may state that the crown was grown in a vessel containing not less than 8,000*l.* worth of magenta, the crown itself being worth upward of 100*l.*

Having now explained the several stages of transition through which coal has to pass before it either becomes mauve or magenta, it may be of some interest to you to know the proportion which the finished dye bears to the coal from which it is derived. A set of specimens for which I am likewise indebted to Mr. Nicholson, is most instructive in this respect. Observe, it commences with a large mass of coal, weighing not less than 100 lbs.; the bottles which follow contain the coal-tar oil, naphtha, benzol, nitro-benzol, and aniline, obtainable in succession from 100 lbs. of coal; remark how they gradually diminish in size, and how small, I might almost say insignificant, appears the bulk of magenta finally obtained. But compare the bulk of wool which this minute quantity will dye. It approximates to the bulk of coal with which we started. This comparison evinces, perhaps, sufficiently the extraordinary tinctorial power which this class of dye possesses, but a very simple experiment may possibly convey to you this idea even in a more impressive manner. The white paper which covers this large frame has been dusted over with a minute quantity of mauve; a second one is treated in a similar manner with magenta. The quantity of coloring matter is so small, that the paper has retained its original white color; but observe how it changes when I dash a beaker full of spirit against these squares; immediately the lovely purple of mauve is developed upon one of them, while the other one exhibits the dazzling crimson of magenta.

But let us now proceed to illustrate the mode of dyeing. For this purpose I introduce silk and wool, both unspun and woven, in succession, into solutions of mauve, of magenta, and, lastly, of a splendid new purple, lately discovered by Mr. Nicholson. Observe the extraordinary facility with which the coal-tar colors are fixed both on wool and silk. These materials require no previous preparation, being dyed, in fact, simply by dipping, without the aid of any mordant. Silk and wool are animal substances; vegetal materials, such as cotton and linen, unless previously submitted to a special treatment, are scarcely affected by these dyes. This fact admits of being beautifully illustrated by dyeing linen fabrics on which ornaments have been embroidered in silk ribbon. The articles, when coming out of the bath, appear uniformly dyed; but by washing, first in pure water and then in dilute ammonia, the color rapidly vanishes from the linen ground, leaving the silk embroidery in brilliant colors. This extraordinary predilection of aniline colors for animal substances is, moreover, strikingly illustrated by the condition of my hands, which by this time have acquired a thoroughly magentic appearance. Fortunately, the coal-tar colors are unable to resist the action of chloride of lime, and I have therefore only to immerse my hands for a moment into a solution of bleaching powder.

Already the color on my hands, you observe, has gone, but with the color, I am afraid, my time too. Let me endeavor to bring this lecture to a conclusion. I have fulfilled in a measure the promise which I gave you at the commencement of this discourse. We have crossed together the extensive field which stretches between coal and color. I am impressed, deeply impressed, with the clumsiness of my performance as your guide, but I hope that the interest attached to the territory we have explored may, to some extent, at all events, have indemnified you for the imperfection of my explanations, and that you leave the Royal Institution this evening with the kind of feeling every one of us has more than once experienced after traveling in similar company over a beautiful country—the guide is forgotten, but the impression of the scenery remains.

Having gone thus far, you may think that it is fully time for me to make my bow. But I venture, even at this late hour, to dwell for a moment on the moral of the story which I have told you, though you may feel disposed to consider this story rather a highly colored one.

The material which I had to condense, I might almost say to force, into the short space of an hour, has been overwhelming; and whilst explaining the formation of the various substances which I had to describe, while illustrating their properties by experiment, I have scarcely had time to glance at the history of our subject. This history is not without interest. You readily perceive that a branch of industry like the one I have endeavored to sketch could not possibly have risen like Minerva from the head of Jupiter—a sudden inspiration happily realized. The time, the toil, the thought of a host of inquirers, were necessary to accomplish so remarkable an achievement. You cannot expect me at this late hour to examine minutely into this part of the subject, but I must not take leave of you without alluding to some facts which cannot fail to rivet the lively interest of the members of this institution. Let me tell you then that mauve and magenta are essentially Royal Institution colors; the foundation of this new industry was laid in Albermarle street. Benzol, which I have so repeatedly mentioned—benzol, which may be looked upon as the raw material, capable, under the influence of chemical agents, of assuming such wonderful shapes—benzol is the discovery of our great master, may I not add of our kind friend, Mr. Faraday. This volume, "The Philosophical Transactions for 1825," contains the description of his experiments. In 1825, thirty-seven years ago, the laboratory of the Royal Institution witnessed the birth of this remarkable body. Yesterday, under the auspices of Mr. Anderson, I invaded the same laboratory, a diligent search was made, and in my hand I hold the trophies of our expedition, the original specimens of benzol which Mr. Faraday prepared. In thus reminding you of one of the early labors of Mr. Faraday—which, owing to the number and vastness of his subsequent discoveries, appears almost to have escaped from his memory like a tradition of years gone by—I have opened a glorious page in the glorious history of the Royal Institution. Benzol has furnished us mauve and magenta, but it has done much more than this. Ever since chemistry became endowed with this wonderful body, benzol has been the carrier of many of the leading ideas in our science. In the hands of Mitscherlich, Zinin, Gerhardt, and Laurent, in the hands of Charles Mansfield—never to be forgotten by his friends—and many others, benzol has been a powerful lever for the advancement of chemical science. Benzol and its derivatives form one of the most interesting chapters in organic chemistry, the progress of which is intimately allied with the history of this compound.

But what has the history of benzol to do with the moral of mauve and magenta? Well, ladies and gentlemen, ask Mr. Faraday; ask him what in 1825 was his object in examining benzol. I have, perhaps, no right to answer this question in Mr. Faraday's presence; but I venture to say that we owe his remarkable inquiry to the pure delight he felt in the elaboration of truth.

It was in the same spirit that his successors continued the work. Patiently they elicited fact after fact; observation was recorded after observation; it was the labor of love performed for the sake of truth; ultimately, by the united efforts of so many ardent inquirers, exerted year after year in the same direction, the chemical history of benzol and its derivatives had been traced. The scientific foundation having thus been laid, the time of application had arrived, and by one bound as it were, these substances, hitherto exclusively the property of the philosopher, appear in the market place of life.

Need I say any more? The moral of mauve and magenta is transparent enough. I read it in your eyes—we understand each other. Whenever in future one of your chemical friends, full of enthusiasm, exhibits and explains to you his newly discovered compound, you will not cool his noble ardor by asking him that terrible of all questions, "What is its use? Will your compound bleach or dye? Will it shave? May it be used as a substitute for leather?" Let him quietly go on with his work. The dye, the lather, the leather will make their appearance in due time. Let him, I repeat it, perform his task. Let him indulge in the pursuit of truth—of truth, pure and simple—of truth, not the sake of mauve, not for the sake of magenta—let him pursue truth for the sake of truth!

LIGHTING APPARATUS FOR LIGHTHOUSES.

At a meeting of the Institution of Mechanical Engineers, held in London in April last, Mr. Armand Masselin, of Birmingham, read the following interesting paper on the construction of lighting apparatus for lighthouses. We take pleasure in acknowledging our indebtedness to Newton's *London Journal of Arts* for the account of the meeting.

The construction and illumination of lighthouses constitutes one of the most important of public undertakings at the present day. The development, however, of the comparative perfection now attained in these two departments has been gradual and unequal. During the century that has elapsed since the erection by Smeaton of the Eddystone lighthouse, when engineering was greatly in advance of practical optics, the art of building towers has received few improvements, while the apparatus for illuminating them has, by the introduction of the dioptric system, acquired a striking degree of excellence. During nearly the whole of the last century, and in some places as late as 1816, open coal fires, improved occasionally by a flat brass plate, placed on the land side, were the rude means usually resorted to for producing light. The Eddystone tower had a lantern to protect the weak light given out by the few miserable tallow candles which were then used, and only in 1807 were these replaced by lights furnished with silver-plated parabolic reflectors. Distinction of one light from another, by its appearance at night, a point nearly as important as the range of the light, was, of course, out of the question.

Lights on the catoptric or reflecting system, composed of silver-plated parabolic reflectors, provided with plain cylindrical burners placed in the focus of each, were used exclusively until 1822, when Augustin Fresnel invented and erected on the Cordovan tower his first dioptric or refracting light. The catoptric or reflecting system was, in comparison with the imperfect means previously available, a valuable improvement, and, under later modifications, is still in extensive use in this country; but having many serious imperfections, it is gradually disappearing before the dioptric or refracting system.

The latest optical and mechanical improvements in the dioptric system are illustrated by the fixed light of the Smalls Rock, near Milford Haven, and the revolving light of Lundy Island, both constructed by Messrs. Chance, and the latter—attested by mariners as the most powerful light in Great Britain—flashing over thirty-five miles of the Atlantic. In the present paper it is intended only to notice briefly the existing state of reflecting and refracting apparatus and the relative merits of each, before giving the particulars of their mechanical construction.

In the dioptric or refracting system, only one lamp is used, placed in the vertical axis of the apparatus. In fixed lights, the middle or dioptric part having the lamp in its centre, is cylindrical, and composed of a series of refracting rings or lenses, which are so shaped as to give a horizontal direction to all the rays of light that fall from the lamp upon their inner faces. All the rays of light passing above and below these middle lenses are received by upper and lower catadioptric prisms, by which they are also transmitted horizontally after refraction and total reflection in the prisms. Every piece of glass in the apparatus forms a portion of a horizontal ring or belt, having its centre in the vertical axis of the apparatus. The rays of light given out by the lamp are thus collected and transmitted equally over the horizon, and the light is rendered luminous throughout its entire height. The glass prisms are fixed in eight gun-metal standards, forming an octagonal frame, each prism being supported in the centre by passing through an intermediate standard.

In revolving lights, the transverse section of the refracting lenses and prisms is precisely the same as in fixed lights: but, in revolving lights, the rings of glass are concentric round a horizontal axis, passing through the brightest part of the flame, instead of round the

vertical axis. The circumference is divided into eight flat faces, each composed of a series of prismatic rings and segments having one common focus; the light emanating from the lamp is thus transmitted by each face in a brilliant flash extending over the whole width and height of the face; and the whole apparatus being made to revolve by clockwork, every point of the horizon is illuminated by a succession of brilliant flashes corresponding to the several faces, and at intervals of time determined by the speed of revolution. By the use of fixed and revolving lights, or combinations of them in various ways, lights of distinct appearance are produced in a number sufficient for all purposes that are required in practice.

Dioptric lights are made of six different sizes or "orders," as they are termed; and the following table gives the internal radius of the apparatus or the focal distance in each order, the number of wicks in the lamp, and the consumption of oil in lbs. per hour, and in gallons per year, assuming the light to burn 11 hours per night, on an average, throughout the year.

Orders of Dioptric Lights.

Order.	Internal radius of Light.	Number of Wicks.	Consumption of Oil.	
			Lbs. per hour	Gallons per year.
	Inches.		Lbs.	Gallons.
First.....	36.22	4	1.65	780
Second.....	27.55	3	1.10	490
Third.....	19.68	2	0.41	130
Fourth.....	9.84	2	0.26	116
Fifth.....	7.28	1	0.17	76
Sixth.....	5.90	1	0.17	76

The three largest orders are generally termed sea lights, and the three smaller ones harbor lights. The first order, as the most important, will alone be referred to in this paper, the others differing merely in size and number of prisms and lenses.

In the catoptric, or reflecting system, a number of parabolic reflectors are used, ranged round a framework, according to the purpose required, with a lamp in the focus of each reflector. In a fixed light, these reflectors, frequently as many as 24 or 30 in number, are arranged round the frame, so as to equalize the light as much as possible in all directions. In revolving lights, the reflectors are mounted on a revolving frame, having generally three faces, each of which carries an equal number of reflectors. Three flashes of light are thus produced, which illuminate successively every point of the horizon at intervals regulated by the speed of revolution. The loss of light in this system is necessarily very large: indeed, nearly the whole of the light from the front of the flame is directly lost by natural divergence, the reflectors transmitting to the horizon only the rays emanating from the back of the flame; and of this light nearly 50 per cent. is lost by the absorption that always takes place in reflection by metallic surfaces.

Comparing the two systems together, it is evident that for fixed lights no possible combination of reflectors can distribute a zone of light of equal intensity round the horizon, whilst this effect is completely obtained by the dioptric system. It is found that whilst only 3½ per cent. of a plain open light would be available round the entire horizon, 17 per cent. is obtained by the use of the best reflectors, but 83 per cent. is obtained by the use of the dioptric lights. The extreme divergence of the rays of light from a usual 21-inch reflector, with a 1-inch flame, is about 14 degrees; but the variation of the intensity of the flash emitted over this angle is very large indeed, the intensity of the light being only 16 per cent. on the sides of what it is in the axis of the flash, showing how great is the irregularity of the light spread over the horizon. Also the numerous fastenings of the reflectors and lamps frequently get loosened, increasing greatly the irregularity of the light. Nor is the whole amount of divergence, taken vertically, useful; for, as will be shown afterwards, the lower portion of the vertical divergence required to illuminate the sea between the horizon and the land is but a very small amount. In uniformity of light, therefore, throughout the horizon illuminated, the dioptric system is very greatly superior to the reflecting for fixed lights. With regard to economy of oil, fifteen reflector lamps together consume as much oil as the one central lamp in the dioptric light, and the saving therefore amounts to 50 per cent. in favor of the latter, compared with a reflecting light of the largest practicable size, having thirty lamps, but greatly inferior in illuminating power to the dioptric light.

Another very important consideration is the durability of the apparatus. The longest time that reflectors will last, even when treated with the greatest care, is from 25 to 30 years; their thin silver coating will have completely disappeared at the end of that time. With moderate care and no necessity for re-adjustment, dioptric lights may be considered as imperishable; the lenses and prisms never lose their correct form and first polish, never require renewal, and are kept always equally efficient with a far less amount of daily labor than that required for reflectors. The number of attendants or keepers required is the same in both cases, and the first outlay may be considered as generally equal.

For revolving lights, however, the catoptric system presents fewer points of inferiority as compared with the dioptric: for, by sufficiently increasing the number of lamps and reflectors on each face of the revolving frame, a light of equal intensity to the dioptric might be produced. The illuminating power, consumption of oil, durability, and general outlay, will therefore be the chief considerations to determine the relative advantages of the two systems for revolving lights. The effect of only one of the eight faces composed of annular lenses in a first order dioptric light is equal to that of eight of the largest reflectors in use, 21 inches in diameter; and, consequently, to produce by reflectors the effect of the best dioptric light, a lantern would have to be provided capable of accommodating from 56 to 72 reflectors—an arrangement all but impracticable. Moreover, at a time when most of the experiments were made both in this country and abroad, for comparing the intensity of revolving dioptric and reflecting lights, the dioptric lights were composed merely of the central or singly refracting part. But in the present holophotal system, in which the upper and lower reflecting prisms are made to continue and extend the action of the central refracting lenses, as already described, the intensity of the dioptric lights has been nearly doubled, and the comparison rendered so much more unfavorable to the reflecting system.

The only objection which has been seriously urged against the dioptric system is the use of only a single central lamp, on account of any difficulty in its management affecting the whole light, or danger of its sudden extinction. This is met, however, by the successful experience of forty years with an immense number of lights in different parts of the world. Hardly ever has such a case occurred; and as spare burners are invariably supplied, and required always to be kept ready for use, a few minutes only would suffice to remove the defective burner and replace it by another.

The lamp necessarily forms a very important part of the lighthouse apparatus, in the efficiency of which it is an essential element. The lamps generally used in the larger dioptric lights are of the class known as mechanical lamps, in which the oil is forced from a reservoir into the burner by means of a pump, worked by clockwork, driven by a weight. Although this construction of lamp is simple enough, it requires that the keepers should be trained to its use, and should have a thorough knowledge of the way of taking it to pieces for cleaning, and then putting it together again, before they are sent to their respective lighthouses. As this precaution was not at first universally adopted in lighthouses, complaints were made against the mechanical lamp; and, in consequence, lamps of the simplest possible construction, but inefficient in action, came into use into this country, consisting simply of a side reservoir, communicating by a tube with the burner, the level of oil in both being the same. The consequent absence of overflow prevented a high flame from being obtained and greatly impaired the efficiency of the light, which doubtless considerably retarded the adoption of the dioptric system. Pressure lamps were also made more lately, consisting of a large cylindrical oil reservoir containing a piston fitted with a cupped-leather packing, the pressure being obtained by a number of small weights arranged round the piston; whereby the oil was forced through the side tube into the burner. These lamps, however, presented many inconveniences: the pressure could not conveniently be varied, since the addition of one weight tended to cant the piston out of its horizontal position, and allow the oil to escape at the opposite side. The cylinder being made only of sheet brass, and, therefore, not perfectly cylindrical, a considerable difference of diameter between the piston and cylinder was required; and when the oil became rather warm, the leather got so soft that it was liable to turn over and render the lamp useless. The piston being entirely submerged, lost a portion of its weight; and whenever the pressure had to be varied, the weights taken out were covered with oil, and there was a great waste by the oil being spilled: there was also a liability to leakage, from the body of the lamp being made of several parts soldered together.

The conditions the lamps are required to fulfil are:—a constant and even supply of oil to the burner, equal to fully four times the consumption; simplicity of construction, so that any unskilled mechanic can take the lamp to pieces and put it together again; freedom from liability to derangement; and an accurate fit of the various parts, so that all duplicate parts will fit equally well.

To meet these requirements the writer designed a construction of lamp, which has fully answered the purpose. A brass cylinder, containing the oil for the lamp, is cast solid in one piece with the bottom, and bored out truly cylindrical, and is fitted with a turned piston, having a cupped leather packing; the three piston rods are connected at top to a wrought-iron ring, to which are attached the side rods passing down outside the cylinder to the wrought-iron ring below, which carries a weight. The piston is steadied against any small lateral oscillation by six leather guides, fixed round its circumference; and any air underneath is let out through a central vent cock. The oil is forced out at the bottom of the cylinder through an upright tube leading to the burner, the quantity being accurately adjusted by a conical regulating valve, having an index on the screwed handle, which shows the quantity of oil supplied to the burner per minute or per hour. When the piston has descended to the bottom of the cylinder, it is wound up again by a rack and pinion underneath the cylinder; and the oil is prevented from being drawn down from the burner by a check-valve, consisting of a small ball, situate in the feed-pipe. The burner remains therefore constantly fully supplied with oil; and the time occupied by winding up the weight being only a few seconds, the overflow of oil is not even visibly affected. As impurities from the charring of the wicks, and especially a quantity of flue or dust from the cotton wicks, are constantly brought into the cylinder by the overflow oil, and afterwards drawn under the piston, these would find their way up through the feed-tube into the burner, which would cause a stoppage of the supply of oil to the wicks. To prevent this, a fine wire sieve, placed in a box in the feed-tube, arrests any impurities in the oil. Should the sieve get stopped up while the lamp is burning, it can be changed in less than a minute. Each wick is provided with two oil tubes, whereby a constant supply of oil to each wick is obtained, instead of all the wicks being fed by a single exterior tube, as in the previous lamps.

In order to produce a proper illumination of the horizon by this light, it is essential that the full height of flame should be kept up, maintaining the flame correctly in the focus of the apparatus, without which the best optical apparatus would be imperfect in action. For this purpose the overflow of oil must never be less than three or four times the actual consumption; otherwise, the wicks will burn down to the edge of the burner, and the intense heat produced would very soon destroy the burner itself. Moreover, when the supply of oil is too small, the heat of the flame has time to act on the small overflow, and considerably deteriorates the quality of the oil; and the overflow being all returned into the reservoir, the quantity of deteriorated oil in the reservoir increases until it is impossible to maintain a good flame.

The proper shape, diameter, and position of the shoulder or contraction, in the glass chimney used for the lamp, is of special importance, since this has a direct influence upon the shape and height of the flame, and, consequently, upon the intensity of the light produced. An adjustable damper is placed over the glass; and above this a continuous pipe, of about six feet in length, from the burner, is required to pro-

duce a sufficiently rapid draught to support the combustion. When the lamp is lighted at first, the wicks are kept low for some time, and gradually made to rise for about twenty minutes, until they rise about ¾ inch to ⅞ inch above the burner; then, by a slight adjustment of the wicks, to obtain equal height of flame, and the occasional shutting or opening of the damper, a most intensely bright and high flame is obtained and kept up during the whole of the night. The diameter of the burner and flame of a first order lamp is 3½ inches, and, with proper management, the flame is kept up constantly to a nearly uniform height of 4 inches.

The oil used in lamps for lighthouses is the refined colza oil or rapeseed oil, which is the only oil fit for the purpose, and is much superior to the sperm oil formerly used, and is also cheaper. It burns with a brighter flame, and does not cause so much deposit on the wicks, which therefore burn much longer without requiring to be trimmed. It also requires far more intense cold to thicken it than other oils, and there is therefore much less need of the small auxiliary frost lamp used in frosty weather for warming the oil in the main lamp. The thickness of the wicks is another point to be attended to, as a thin wick gives a brighter flame than a thick one under the same circumstances. When a lamp is in proper position, supplied with proper materials, and in the hands of a moderately careful attendant, the flame can be kept up, for fully seventeen hours, to its full size, untouched, without requiring to have the wicks trimmed. The quantity of oil consumed in a dioptric light during a given period, is thus, to a certain extent, a test of the efficiency of the light, as it indicates the height of flame kept up during the time.

For producing a revolution in revolving lights, the optical apparatus is carried by a revolving platform, which is mounted on a large cast-iron pedestal that receives the clockwork for producing the revolving motion. This platform is carried on gun-metal rollers, centred on a live roller frame, running round a fixed centre shaft on the top of the pedestal. The roller paths on the top of the pedestal and the under side of the revolving platform are of steel; and the rollers are fitted on their spindles with washers of different thickness, to allow of slightly varying their positions from time to time, in order to avoid grooving the paths, by running constantly in one line. The driving motion is communicated from the clockwork by a pinion gearing into an internal toothed wheel on the under side of the platform. The clockwork is driven by a heavy weight, and the speed is regulated by a pair of flies on the fly-wheel, which are adjusted to the proper angle for controlling the motion to the required speed. The whole of this improved arrangement of clockwork and pedestal was devised by Messrs. Stevenson, of Edinburgh, for the service of the Northern Lights, where its constant use for many years has proved its great superiority over the arrangements adopted in all other revolving lights.

The optical apparatus itself is of an octagonal shape, and the frame is constructed entirely of gun-metal. The catadioptric prisms, composing the upper and lower portions of the light, are fixed in the eight gun-metal standards of the frame; but the lenses forming the central portion are carried in separate frames, bolted to the standards, with a slight clearance left at the top, to prevent the risk of any weight coming on the rings of glass forming the lenses, which, being in close contact with one another, would give way under the least pressure. At the bottom the prisms are omitted in one side, to allow of access to the lamp, which is erected upon a stand on the service table. A copper ventilating tube extends up above the lamp into the neck of the cowl, on the plan introduced into the lighthouse service by Professor Faraday. Inverted funnels are placed at different levels in the ventilating tube, to afford a free escape to any accidental downward gust of wind, and thus prevent any risk of the lamp being blown out. The draught of the heated air in the tube also draws off, through the funnels, a quantity of the air of the light-room; thereby preventing condensation of the moist air upon the glazing of the room, which would otherwise interfere greatly with the efficiency of the light. A short length of the tube at the bottom, containing the damper, is made to slide upwards, to allow of removing the glass chimney, but so as not to weigh on the glass or fall when the glass is taken out.

The lantern, within which the whole of the lighting apparatus is contained, is of an octagonal shape. It is 13 feet in diameter, and formed of cast-iron panels, with the joints planed to the proper bevel, so as to fit solid together. The standards supporting the dome of the lantern, and forming the framing of the plate-glass frames, are of wrought iron, and inclined alternately right and left, which adds greatly to the stiffness of the structure; while the light is not entirely intercepted in any vertical plane, as would be the case if the standards were vertical. To prevent corrosion by the action of the sea air, the standards are protected along the outer edge with a gun-metal facing, grooved to receive the plate-glass panes, which are then secured in their places by thin covering strips of gun-metal screwed on outside.

The glazing of the lantern consists of panes of plate glass about ⅝ inch thick, the edges of which are ground, and the arises bevelled, to prevent breakage in fixing, or in any possible shaking of the lantern in a violent gale. Small strips of lead are placed between the glass and the gun-metal frames, and the interstices are filled up with putty. The glass lies entirely within gun-metal frames, and there is no difficulty in replacing a broken pane at any time. To guard against an accidental stoppage of the light, through breakage of a pane in a gale, or by sea-birds flying against the glass, storm-panes are provided, made of a copper frame glazed with thick glass, which are kept always ready in the light-room, and can be fixed in a few minutes in place of a broken pane. A copper dome forms the roof of the lantern: it is made double, with an open space between; and the cowl, at its summit, revolves with the weathercock, to turn the openings always from the wind, allowing a free escape for the heated air from the ventilating tube of the lamp.

The efficiency of a dioptric light depends entirely upon the proper adjustment of the various optical elements which compose it. The vertical divergence of the rays of light depends on the dimensions of the flame of the lamp, and seldom exceeds an angle of 5 degrees, which is amply sufficient for all practical purposes. For an angle of vertical divergence, equal to one-fourth of the dip of the horizon, illuminates half the whole distance from the horizon to the lighthouse; and an angle of vertical divergence equal to the dip of the horizon, illuminates three-fourths of that distance. Within a mile or two from the lighthouse, however, an angle of vertical divergence equal to the dip of the horizon, illuminates only a small fraction of a mile, showing how little is gained by increasing the vertical divergence at the sacrifice of brilliancy at the horizon. Thus, for a tower of 100 feet height, about 1-6th of a degree (9′ 45″) is the amount of the dip of the horizon, and a further angle of the same amount illuminates the sea from the horizon towards the land for a length of 8½ nautical miles, the total range of the light being in this case 11⅝ miles. For a tower of 200 feet height, the dip is about ¼th of a degree (13′ 46″), and a further angle of the same amount illuminates from the horizon a distance of 12 miles out of a range of 16 miles. These figures show that a vertical divergence equal to the dip of the horizon is quite sufficient to illuminate the sea from the horizon up to within a moderate range of the tower.

The efficiency of the light depends also upon its being correctly adapted in direction and divergence to the particular elevation it is intended to occupy, otherwise a portion of the brightest rays may pass above the horizon, and consequently be lost, instead of being of service at and within the horizon. The dioptric system affords peculiar facility for directing the light upon any particular point where it is more especially required. For instance, a light may be required merely as a sea light, for the purpose of signalling to mariners their approach to the land: in that case the most intense light of the whole apparatus is directed towards the horizon. Or a light may be required to illuminate the horizon, but most particularly the sea in the neighborhood of the land, the approaches of a harbor, or some particular local danger: in that case, the light of some portions of the apparatus is directed towards the horizon, and the light of the other portions is deflected towards the point requiring special illumination.

PETROLEUM ITEMS.

Storage of Petroleum in London.—At a recent meeting of the Metropolitan Board of Works of London, the subject of the storage of petroleum came up for consideration. The following report was submitted from the Streets Committee:—

"In pursuance of the resolution of the board of the 11th of July last, your committee have considered the question of the arrangements necessary to be made by the board for carrying out the provisions of the Petroleum Act; and have conferred with your solicitor and superintending architect as to framing some general rules and forms for that purpose. Your committee have bestowed much attention on the subject; and it appears to them that, as the building in which the petroleum is to be stored in the metropolis must vary with the quantity of the material, and the locality of its deposit, and the precautions to be adopted must depend on the arrangement and distribution, as well as on the nature and construction of the premises, it will not be possible to lay down precise rules which shall be applicable to every particular case; but that it will be necessary to obtain from applicants under the Act, an exact description of their store-rooms and warehouses, so that your superintending architect may report to your honorable board upon the merits of each individual application, as they from time to time arise; and they recommend:

"That parties, in making applications for licenses, under the Petroleum Act, be required to send in full particulars, together with a plan of the premises proposed to be used or adapted for the storing and safe keeping of petroleum, with a view to each place being examined and reported upon by the proper officer of the board."

A discussion of some length followed the motion to adopt the above report, and different views were expressed by the members of the board, as to the inflammable and explosive nature of petroleum, and as to the details of regulations to provide safe places for its storage. The report was adopted with the substitution of the words "superintending architect" for "superior officer." An application having been made by Mr. D. E. Timothy for a license to store petroleum on Mellish's Wharf, the following report upon this application, by the superintending architect was presented before the board:

"This being the first application for a license from this board, 'for the safe-keeping of petroleum, and certain products thereof, that are dangerous to life and property, from their properties of giving off inflammable vapors at low temperatures,' it appears desirable to enter rather fully upon the subject, in order that the future practice may be, as far as circumstances will permit, uniform.

"Various rumors are abroad as to the dangers of petroleum. By some it is magnified to a fearful extent, whilst others regard it as only a little more dangerous than turpentine, or similar inflammable liquids. But, at any rate, the Legislature has thought fit to pass the act, and it must be carried into effect, with every care that the intention of the act should be fulfilled.

"Messrs. Timothy's premises are shown, though not quite correctly, on the accompanying plan. They extend from the river to the West ferry road, 457 feet, with a river frontage of 135 feet 9 inches, but less by one fourth next the Ferry Road. The buildings, with the exception of those marked R and S, are brick-built and substantial; and it is in most of those colored blue that petroleum in casks is stored to a large extent, there being between two and three thousand barrels of from 22 to 26 gallons each already on the premises; and it was stated at the survey, that there is room for nearly four times the quantity when the buildings R and S are used, and the others more closely packed.

"In April last, in consequence of an earnest representation of the fire offices, the Secretary of State for the Home Department ordered that these premises should be inspected, to ascertain what additional caution should be taken to render them secure, as against the spread of fire; and Mr. H. A. Hunt, surveyor to the office of Her Majesty's Works and Buildings, made an inspection and report, the substance of which was, as I understand, that the outer walls in many places should be raised, and that some new sheds (T and P on plan) should be so constructed as that the surface-level inside should be two feet lower than that outside; and that the sheds on the sides next the premises should be open from about four feet above ground, and the roof slated or tiled. All these suggestions have been carried out, and the parapet walls next the two adjoining premises carried up several feet higher than the gutters; whilst in one portion, a wall, without any building against it, has been built 30 feet high. Most of the stores are lofty and well ventilated, and every care is said to be taken that no light or fire be used in any part of the premises approaching the stores. It should be mentioned that the ground falls several feet from west to east; so that, in the event of a fire and the casks should burst, the flow of the liquid would not be likely to endanger any shipping in the Thames, but

might probably run into the public thoroughfares and get into the sewers.

"Mr. Timothy's neighbors, Messrs. Fenner on the south, and Messrs. Barney and Bellamy on the north, are apprehensive on account of this large storage, and complain that their insurances are affected. Messrs. Fenner state that they are bound to insure under forfeiture of their lease, but have received a letter (which is now in the office) from the Royal Insurance Company, declining to continue their policies until after Michaelmas last, and they strongly urge this board not to license Mr. Timothy's premises.

"With regard to the precautions suggested by Mr. Hunt, I consider that Mr. Timothy has properly carried them out. As far as they go, they are no doubt very excellent provisions for keeping ordinary fire within the premises, should no wind be up; but, if with a quantity of petroleum running about, it blew from the north, nothing could save Mr. Timothy's premises, where resin and pitch are largely stored; and if, from the opposite quarter, those of Messrs. Barney would be sacrificed, as well as others adjoining.

"From all I can collect on the subject, the great danger is in the petroleum getting loose from the bursting of the casks when a fire happens, and it has occurred to me that one great point in its safe keeping would be to provide against that contingency. This I would propose to do by requiring that the casks should be stored in constructed basins or tanks, either of iron or brick, sunk two or three feet below the ordinary ground level, and of such capacity as to contain all the liquid, allowing of course for the displacement occasioned by the casks, and for six inches at least below the top of the basin. A mere shed over all, with a projecting roof, would be all that is necessary for shelter from the sun and weather, taking care where such shed joins other property, or another store, that sufficient brick walls, without openings, be erected. This expedient, though costly in the first outset, together with a sufficient height of boundary wall, would, I believe, be very effectual in arresting and keeping a fire within bounds, provided the wind was not adversely high.

"The question, however, arises, as to what course to pursue in regard to the application made by Mr. Timothy, for, if the Legislature has considered it expedient to make the act apply to so small a quantity as something over 40 gallons, it seems clear that more than ordinary caution should be taken when, as in the present instance, probably more than 50,000 gallons are concerned, and four times that quantity could be stored.

"It seems desirable that a limit should be fixed to the quantity to be stored on the same premises, as well as to the time over which the license should extend.

"My opinion is, that in several of Mr. Timothy's buildings a moderate quantity of petroleum may be safely kept; as those, for instance, where the surface of the ground is sunk—namely, the cellar next the pathway, and those marked P and T, which alone would contain several hundred casks, in single layers; but I much doubt the expediency of allowing them to be piled up three tiers, as is the case in part of these premises, unless, as I have suggested, a sunk reservoir be constructed, capable of containing, without overflow, the contents of the casks stored therein.

"I have dealt fully with this case, as the board's determination upon it will elicit a principle of action with regard to many others.

(Signed) "GEORGE VULLIAMY
"Superintending Architect."

PETROLEUM TRADE OF CANADA.—*The Scientific American* says: A statement made by a Toronto journal shows the wonderful development of the petroleum trade in Canada West. From the wells at Wyoming station, on the Great Western Railway, between 2,500 and 3,000 barrels per week are exported; but so fast is the business increasing that application for transporting 60,000 barrels has been made to the company. In that portion of Enniskillen township in which petroleum is found, the annual receipts amount to $427,000, yet this is only a beginning. Almost every day brings strangers from England to the neighborhood, inquiring into the truth of the reports given out respecting the wells. The Canadian Oil Company of London have sent out an agent to make inquiries before commencing operations. It is reported that other companies are being formed in Great Britain to carry on the extensive business of barrelling, shipping and refining the article. One western firm have cleared $10,000 by the direct shipment of 2,000 barrels to England; and we hear that several vessels are now on their way to Sarnia to be loaded, while still larger quantities are going forward by rail to the Atlantic ports. The Great Western Railway Company are about to construct a branch road to the springs; a plank road to Dresden, on the Sydenham river, is also talked about. The making of barrels has already become a large business in that part of the country. Several refineries are being started in Enniskillen. Whether these all succeed in retaining the manufacture in the province, or whether it will be carried on principally in England, is yet conjectural.

EXPORTATION OF PETROLEUM FROM PHILADELPHIA.—The *U. S. Railroad and Mining Register* gives the following statement of the exportation from Philadelphia since January 1, 1862:

Months.	Gallons.	Value.
January	234,505	$53,290
February	3,606	1,785
March	369,184	89,575
April	145,575	25,720
May	192,462	29,519
June	97,875	11,963
July	272,450	35,994
August	156,120	26,088
September	385,904	55,447
October	185,157	33,357
Total	2,062,208	$362,943

The following quantity has been exported to foreign ports:

	Gallons.	Value.
First quarter, 1862	627,285	$144,645
Second quarter, 1862	455,412	67,212
Third quarter, 1862	814,477	117,529
Total	1,877,171	$329,380

HEAVY DEMAND FOR PETROLEUM FOR RUSSIA.—It is said that a prominent public functionary (no relation to the "old public functionary" although from the same state) is in the market with an order for the immense quantity of one hundred thousand barrels of petroleum for the St. Petersburgh gas-works. This large order will, it is supposed, have the effect of stiffening prices.

PETROLEUM IN ENGLAND.—The exports of petroleum oil have become of so much importance that at Liverpool an immense fire-proof building is being erected at one of the docks, for the exclusive purpose of storing the petroleum as it arrives. The building is to be furnished with iron tanks capable of holding 320,500 gallons, and with room above the tank for storing 140,000 in casks.

PETROLEUM GAS.—The *Scientific American* says: Gas is now manufactured in Canada from crude petroleum; its cost is but $1 70 per 1,000 cubic feet.

[If Canada cannot make gas from petroleum at a less cost than $1 70, the people of that province ought to send for some Yankee to teach them how. Coal gas is made in many places for *much* less than that.—ED.]

THE OIL MARKET.—At last accounts the demand has been brisk, and the supply limited, and consequently prices range still higher. The Oil City *Register* gives the following reasons why some parties are still holding out for more remunerative prices:

"1st. That the oil has a higher intrinsic value than has yet been given for it; that the principal markets of this country and Europe will consume more than we can produce, and as it is the cheapest and best light known, at even more than double the present prices, consumers must have it.

"2d. That the daily flow of the oil is decreasing, the present daily flow of the whole region being estimated at scarcely 4,000 barrels, and more than half of this will be needed for our own refineries, and about 1,000 barrels per day are being sent forward to Titusville, leaving but a small balance for Pittsburg and other points.

"Purchasers can, of course, draw their own inferences as to the correctness of this reasoning, as we have no desire to speculate, but to give a weekly statement of facts as they occur here. We have often been asked during the past week the amount of oil in tank on the Creek. We have been unable to ascertain the precise amount, but can only count up about 100,000 barrels. Probably half of this, perhaps more, belongs to refiners who own interests in the wells, and a great portion of the balance is being held for the highest market price. The Woodford well, on the Tarr farm, flowing about 400 barrels per day, stopped flowing on Monday morning last. Barrels are in brisk demand at $2 to $2 50, according to quality. Freights to Pittsburg from $1 to $1 25. The river is rising slowly, and up to this evening there is two feet two inches steamboat water, and two feet seven inches keelboat water, and the weather clear and pleasant. Our market closes firm and buoyant with an upward tendency.

"In Pittsburg the demand is very active, there being little or no crude in the market. The range of the market for the week is from 15 to 20 cents for crude, and market firm and buoyant. In the Eastern markets oil is in brisk demand, and prices are advancing. The quotations for crude range from 21 to 30 cents; refined, 45 to 62. The European markets will be found in another column. Oil men are preparing for the expected rise, and if the river continues raising the barrel boats will start for Pittsburg to-morrow or next day. The bulk boats will require more of a rise."

THE BEST GAS-BURNERS.

Mr. Rutter, in his little work on "The Advantages of Gas-Light in Private Houses," thus speaks of the forms of burners best adapted for general use:

"For general purposes, the most useful form of burner is the argand; and of the various sizes, the most economical is the 15-hole. With this burner the gas is consumed under the most favorable conditions of which it is susceptible; and hence the light obtained from a given quantity of gas is greater in proportion than by any other means. The principle of the argand burner consists in admitting a current of air simultaneously to the interior and exterior surfaces of a (hollow) cylindrical column of gas, and the most beneficial effects are obtained when the quantity of gas so supplied is sufficiently controlled that it causes perfect, but not vivid combustion. Some of the burners which have lately been brought into notice are inferior to the common argand as regards economization of gas. Others, constructed with the intention of producing vivid combustion, by deflecting a current of air upon the gas flame, are well adapted for situations where a brilliant light is required in a limited space, and where a good supply of fresh air can be obtained. They ought not to be used in private or other closed apartments, unless there be free ventilation. However varied the forms or the names of burners, there is no very wide range in the application of the principle. The more tranquil and perfect the combustion, other conditions being equal, the greater the quantity of light from a given quantity of gas. The more intense the combustion, the greater will be the quantity of gas consumed and of heat generated, to produce an equal quantity of light. To some persons these latter conditions will be of no importance. I only remind them, if they complain of heat, the gas is not to be blamed, but the burner.

"Exaggerated statements as to the economical effects of certain kinds of burners are put before the public with the semblance of truth. These must be received subject to large deductions. Carefully and delicately-conducted experiments are very different in their results to the hard, rough practice of every-day life. Let there be every encouragement given to improvements; but mere alterations do not always deserve the name of improvements.

"Next in order to the argand burner, for cleanliness and economy, is the fish tail, which is very extensively used, and when enclosed in an appropriate glass has a very pleasing effect. It is applicable to small rooms, and for servants' offices, passages, entrance halls, and front-door lamps. In almost every house there are particular situations where a light will be a great convenience but where the least possible quantity will be sufficient for all useful purposes. In such places a single jet burner will be most appropriate, which, with careful management, will yield light equal to that from a candle, at a cost of about four shillings a year."

NATURAL GAS IN THE KANAWHA VALLEY.—At a recent meeting of the Polytechnic Association of the American Institute of this city, Mr. Brace said that he manufactured coal oil before the rock oils came into use, and on the discovery of petroleum, he removed to the Valley of the Kanawha. An old well had been sunk in that valley twenty years ago for salt, and a spring of oil was struck and thousands of barrels ran to waste. After the present excitement in relation to petroleum had commenced, that old well was cleaned out, but the oil had ceased to flow. On the other hand, eighteen years ago, in boring for salt, a reservoir of gas was struck, when the drill and rods, weighing 2,400 lbs., were thrown out like a ramrod from a gun, and that gas has been blowing ever since. A gasholder has been erected and the gas has been used for boiling the salt. The salt water and gas both come from the same hole, and 800 barrels of salt are made per day; the gas being sufficient to boil half this amount.

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The importance of petroleum as an article of trade has been fully established, and with a rapidity almost unequalled it has assumed a position of no small prominence among the merchantable commodities of the world. We have occasionally published statistical figures, giving the amount of this substance exported from the country. These figures reveal the wonderful growth of the traffic in an article which was, but two or three years ago, unknown to commerce, but which, at the present time, challenges emulation in the capital invested, the hands employed, the collateral branches of industry fostered, and the revolution created in the demand for artificial illuminating agents—excepting from this latter class gas alone. Nor can gas be entirely excepted. The adoption of petroleum as a gas-making material, though now but in its infancy, promises to spread and increase, and the probability is that in a very few years it will be relied upon to a far greater extent than at present, or even than its most sanguine advocates now hope for. Possessing the elements of illumination in a very high degree, and being withal easily managed, and rapidly converted into gas, petroleum has claims upon the attention of engineers who have as yet failed to recognize them; and it has advantages which will repay a close examination of its peculiar properties as a new material for the retort-house.

The immense traffic in petroleum has stimulated collateral branches of industry to an extent almost unprecedented in the history of commerce. The enormous demand for barrels and barrel machinery alone has fully kept pace with the supply, and at some of the wells so scarce have these receptacles been, that operators in petroleum have been put to serious disadvantages from a lack of a sufficient number to convey their product to market. The demand for boring machinery; for iron tubing to insert into the wells; for labor, and a host of other requisites, has grown with such rapidity as to be regarded as a wonder of the age; while the immigration of operators and speculators to the regions where the oil abounds, is suggestive of the incursion of California gold-seekers, when the first intimations of the existence of gold were noised abroad.

The cosmopolitan tendencies of commerce have introduced petroleum as a legitimate article of trade into all the ports of the civilized world, and vessels are now bearing cargoes of it to distant lands, and even among the semi-civilized nations of Asia. In Europe—particularly in England—a large and steadily increasing demand exists for it, and new uses have been found for it, which other hydro-carbons have heretofore supplied. The scarcity of the latter—the resins, pitch and turpentine of North Carolina—produced by the Southern rebellion, caused investigations to be made into the qualities of petroleum and its distillates, which successfully demonstrated that the predictions of science were true, and that bodies possessing all or nearly all the properties of the distillates of the *Pinus* could be prepared from the crude rock oils of Pennsylvania and Canada.

But the introduction of petroleum to the world, and the experiments which have been made with it, have also shown that with all the recommendations it presents, it has some drawbacks which militate against its promiscuous use, and point out the fact that only under certain restrictions can it be safely stored and transported in any considerable quantities. The highly volatile nature of some of the hydro-carbons constituting crude petroleum is well known. Of the inflammable character of these subtle fluids, and the tendency of their vapor to explode when mingled with atmospheric air, we have had sufficient evidence in the disastrous conflagrations which have occurred, and the loss of life consequent upon these catastrophes. Not only in confined places, where the crude oils have been stored, but even at the wells, where no buildings were near, explosions have taken place, and all these facts have demonstrated that only under circumstances where great caution is observed, can absolute safety be depended upon. In view of the explosive nature of the vapor of petroleum, the public authorities in almost every city, where it forms an important article of trade, have considered and passed ordinances regulating its storage, and prescribing strict rules to be complied with. In London the subject has lately been considered by the Metropolitan Board of Works, who have been minute in their inquiries as to the danger to be apprehended from the promiscuous storage of the article. In another column will be found a short report made to the Board upon this subject, and also a letter from Mr. VULLIAMY, the Superintending Architect to the Board, relative to the application of the Messrs. TIMOTHY for permission to store petroleum in their premises. This application was opposed by several of the immediate neighbors of the firm mentioned—the opponents feeling unsafe lest a fire should ensue, in which event their own premises would be liable to destruction. The subject was referred to a committee, with instructions to report at a future meeting.

Almost coincident with the sessions of the Metropolitan Board of Works, of London, relating to this subject, the Committee of the Board of Aldermen of this city have held several meetings, at which the danger of promiscuous storage of petroleum formed the subject of discussion. This Committee, consisting of Aldermen ALEX. FREAR, PETER MITCHELL, and JOHN H. BRADY, held their first meeting on the 6th inst., at which Fire Marshal BAKER was present to announce his official views. A number of gentlemen connected with the petroleum business, and representatives of the Insurance companies, were likewise present. A report of the meetings of the Committee will be found in another part of this number of the JOURNAL. It is the determination of the Committee to give this matter an impartial hearing, and to allow fair play to all parties connected with it. The opposing interests of the insurance companies and dealers in the crude petroleum will be duly considered, and it is to be hoped that a statute may be adopted which shall be satisfactory to all parties concerned. On the one hand, public safety and the rights of the people demand an ordinance which will provide protection against explosive materials, and insure them against losses which might ensue from a too unlimited storage of petroleum; while on the other, the interests of a very important and growing branch of trade require that the ordinance proposed to be passed should not be too stringent in its nature, but should be carefully and impartially considered, and every clause of it be subjected to the closest scrutiny. The action of the Committee must not be too precipitate, for this is a subject of great importance, and one involving a vast amount of capital; and although the business of petroleum is still in its infancy, yet it is an infant of gigantic dimensions, and one which will not permit any unnecessary tampering or trifling.

Gas companies are interested in this matter, for they will, sooner or later, use more or less of petroleum or its distillates in their operations. It will be a matter of some importance to them whether a hundred or a dozen barrels of oil will be permitted to be stored in one place. New York is not the only place where ordinances affecting the storage of petroleum are talked of. In other cities they have been passed, and their provisions have sometimes been found to be prejudicial to the trade—both buyers and sellers—and far more stringent than there is any necessity for. We hope the sitting of the Aldermanic Committee may be productive of an equitable ordinance, and that they will result in a more satisfactory conclusion than the sittings of the Gas Committee, which we had occasion to notice in our last issue. That Committee has probably died a natural death, or it may be put down as among the missing—for nothing has been heard of it since the day appointed for its meeting, when not one of its members thought it important enough to attend.

BULL.

Bull is an institution. Bull edits the London *Journal of Gas-Lighting*, an obscure sheet printed up a "three-stairs back," somewhere in the *purlieus* of Westminster—equivalent to our Tombs—in London.

Bull is gouty, sixty, and crusty. Eating the hard crust of dependence, doled out by a few old stingy gas corporations of the British metropolis, Bull is "obfusticated" at Little Jonathan's pitching into the powerful monopolies of the Western world. Bull thinks how hardly his own pap is earned, and is naturally horrified at the audacity of Little Jonathan in quarreling with his. Now, Little Jonathan cares not one snap of his little fingers whether the aforesaid wealthy and powerful gas-light companies of the United States relish his views or not. He is just as independent of them as they are of him—just exactly—and they know it, and they like him all the better for it.

When the present unhappy rebellion broke out, some of the wealthy directors of these powerful companies offered to the AMERICAN GAS-LIGHT JOURNAL a liberal annual gratuity for its support, in veiw of its necessary decrease of revenue from existing causes. The offer was generous, prompt, sincere, and appreciated. But it was declined. We preferred to stand upon our own pins, and under circumstances that would liave laid Bull upon his burly back, roaring in the pangs of dissolution, the saucy Little Jonathan has stood up to the music, and thus retained the respect and confidence of his constituents.

This is the secret of his ability to talk plainly to these gas companies. They know well that we have their true interests at heart, and that we are not afraid of them, and we do not intend that their interests shall be jeoparded by the rapacity and stupidity of a few of their directors. We know that there was great difference of opinion among the gas officers as to the policy of imposing the government tax upon the consumers. It was a scurvy trick, and was opposed by the wisest of them, who yielded at last with reluctance, and the result has shown their wisdom and ours.

But the general reader does not appreciate Bull's championship of these injured American gas companies. He does not know that Bull has never men-

tioned the AMERICAN GAS-LIGHT JOURNAL but once before, and then in ridicule, and with true English impudence and patronizing airs. Whenever Bull alludes to American gas matters he gets some other journal to copy our news, and then transfers the intelligence to his own heavy columns, and gives the thief the credit for it. Bull thought that by this last dodge he would be able to weaken our *status* here, and increase his own subscribers in this country, of whom he has now just three—the Manhattan Gas Company take two copies, at least two are sent to them and paid for, but go unopened to the paper-mills, and find their way back in reams to the AMERICAN GAS-LIGHT JOURNAL for our printing—and the third is subscribed for by our friend, R. G. COURTENAY, Esq., Louisville, Ky., out of sheer compassion. Now, we have repeatedly offered to forward, free of charge, subscriptions to our London contemporary; and we here repeat that we will receive subscriptions to that atrociously dull and stupid affair, at the price of eight dollars per annum, (two dollars per annum less than is charged by some of the English news agents;) and further, *we will present each regular subscriber to it with one dollar as a bonus for this year's subscription*, and as a compensation for his undertaking the absorption and digestion of so much heavy matter. Is not this heaping coals of fire on the horns and under the hoofs of this roaring, rampant Bull?

PHILADELPHIA GAS METERS.

It may not be known to our readers that they are quite at liberty to use the meters of any manufacturer they think proper. If any are dissatisfied with the meters in general use here—for which our companies show a more than disinterested preference—let them order from CODE, HOPPER & Co., or R. H. GRATZ & Co., Philadelphia. No better meters are made than theirs, and the New York Gas Companies cannot and will not object to their introduction here.

While we are about it, let us have a fair fight and test, not only of gas itself, but of gas-meters. Let us try the Philadelphia meter, by all means. It is used everywhere else—why not here?

THEM BONDS!

The London *Journal of Gas-Lighting* drags its thirty-six readers in England, and three in America, through a half column or more of trash, for the sole purpose of informing those thirty-nine individuals (the Manhattan, N. Y., takes two copies) that its editor is the holder of two American bonds of £100 ($500) each, which are worth now but three shillings a penny-ha'penny on the dollar—while a year ago, when he had forty-one subscribers, (the Manhattan then taking two copies,) he paid four shillings one penny per dollar for them. Loss to Bull on the two bonds (eleven pence ha'penny on the dollar), $230. We now subscribe fifty dollars towards making Bull whole on this speculation, on condition that he will keep out of American investments hereafter. Who will join us in this benevolent enterprise to give Bull a lift?

Subscriptions received at the office of the AMERICAN GAS-LIGHT JOURNAL anywhere from a penny-ha'penny up to tuppence-farthing, and so on to five dollars. Nobody but ourselves allowed to go fifty dollars on this "dead beat." Hand in the subscriptions. As Saint Paul said to King AGRIPPA, "Would that thou wert as I am; *except these bonds*." So says Bull.

WHY THE CITY GAS COMPANIES SHOULD PAY THEIR OWN TAX.—The London *Journal of Gas-Lighting* says "it would be difficult for the assailants of the New York Gas Companies to assign a reason why the price of gas should not be raised with that of any other manufactured article, according to the diminished value of the paper money received in payment."

Assuming that we are the "assailants" indicated, we have not objected, and do not object, to country gas companies raising their prices or charging the tax to their customers, because their product and profits are small, but these are the companies that do not wish to do it. They are patriotic and public-spirited, and prefer to make a sacrifice, to feel that they are doing something to help their country along.

But we do protest, and we shall always protest, that the city companies should pay their own tax, because their products and their profits are larger, and they are rich. That is just the difference.

Here is the New York Gas Company dividing *one hundred per cent.* extra cash dividend, besides *twenty, thirty, and forty per cent. extra* every year, for several years past.

There is the Manhattan, slipping a check for *ten or fifteen per cent. extra* into the hands of stockholders every now and again, for several years past.

Are not these "a reason?" We would like to hear the British champion of American gas companies gainsay it. The gas companies do not deny it.

TO SUBSCRIBERS.—We hope that subscribers who may fail to receive any numbers of the JOURNAL will promptly notify us of the fact, and we will immediately forward the missing copies. Many numbers never reach those for whom they are intended; and as we have placed the wrapping and mailing department of our paper under stricter supervision than ever, we are confident that no failures to receive numbers can be attributed to a lack of care on our part. The trouble is somewhere in the Post-Office Department, and we are determined to sift the matter to the bottom, and to see whether the people have not a right to demand absolute certainty in the prompt delivery of all mail matter—printed as well as written.

THE HIGH AND LOW OF JOURNALISM.

The London *Journal of Gas-Lighting* in its review of our strictures upon the New York city gas-light companies for endeavoring to shirk the payment of the government tax, pronounces the article one of the lowest specimens of American Journalism.

We accept this characterization from our amiable contemporary, deeply sensible that we have not yet reached the summit of our aspirations in this regard. Our only palliation is, that we are yet young. But we are equally impressed with the fact, and pained at its truth, that the London *Journal* is, on the contrary, a specimen of the *highest* order of English Journalism. Readers will start at this announcement, but it is nevertheless so. Read the leading articles in that so-called English *Journal*, and then read the leaders of the London *Times, Herald, Post Shipping Gazette, Index, Army and Navy Gazette*, and the whole tribe of provincial parrots, breeding and developing the most infamous and wanton falsehoods respecting this nation and its rulers, and yet they are the very pink of English Journalism of the nineteenth century.

In private life, what sooner condemns a man to social coventry than a disregard of truth; in journalism what meanness deserves more such a retribution?

Compare these wretched specimens of English literature of the present day with the gay and dashing *Spectator*, with the brilliant, pungent *Junius*, the learned *Rambler*, or the metaphysical *Friend* of Coleridge.

And to form a correct estimate of the London *Journal of Gas-Lighting*, let any one place the letter and spirit of its articles for the past current year with those of *Silliman's Journal of Science and Arts*, for instance, and he will readily appreciate the difference between the highest order of English and American Journalism.

BOWER'S GAS-METER FLUID.—The glycerine fluid manufactured by Mr. Henry Bower, Philadelphia, is the *only meter fluid* made in this country that will stand the cold here or in Canada. We say this unasked and without qualification.

ANSWERS TO CORRESPONDENTS.

J. E. S., of Pa.—*Your first letter was never received, or we would have replied at once. The parties you mention have gone abroad, and we are not advised as to the time they design remaining away.*

J. McE., of Montreal, C. E.—*The missing numbers have been sent. There is great carelessness somewhere in the post-office, for we take great pains in seeing that subscribers' numbers are securely wrapped and legibly directed ere leaving the office.*

A. D. L., of Md.—*You are not correct in your inferences, and we cannot set you aright. The writer desires to preserve his incognito, and we cannot, therefore, reveal his name.*

P. M. G., of Ill.—*We should be afraid of a boiler carrying the pressure you mention. In the hands of some engineers it would be perfectly safe; but take them in general, it is better to be on the safe side, and to run it with a lower pressure.*

S. H. N. of Ohio.—*The ammoniacal liquor is valuable as a source of salts of ammonia, and should bring a price which would remunerate the company, at least, for the trouble of saving it.*

G. F. T., of Mass.—*There is no gas company in Bridgetown, Barbadoes, but we think it a promising place for one. The population is large and intelligent, and would gladly respond to any liberal proposition to erect gas-works. At least, so we have been informed by parties well acquainted with the place.*

A. D. V., of N. Y.—*All these processes have been advertized in the* JOURNAL, *and you will find the address of some of the parties by casting your eye over our advertising columns. The parties there speak for themselves.*

MR. JOHN JEFFREY, CINCINNATI, OHIO.—We refer our readers to the card of this experienced and able gas-engineer. His specifications, plans, and professional advice may be implicitly relied upon.

MESSRS. R. D. WOOD & Co.—Our respected Quaker friends, Messrs R. D. Wood & Co., of Philadelphia, are largely engaged in manufacturing cast-iron pipe and retorts and other work for gas-companies. Their illustrated advertisement will attract the attention of those interested.

THE AMERICAN GAS-LIGHT JOURNAL IN THE ARMY.—So many of our old readers are away at the war, the JOURNAL has quite a host of readers there. If Jeff. Davis ever captures any of its numbers with the "red legged devils" they may serve to throw some light upon his rascality. Our mission is LIGHT.

THE COMING REVOLUTION IN THE MANUFACTURE OF GAS.—Our readers have noticed the able articles on this subject which have appeared in recent numbers of this JOURNAL. The writer of them has had considerable experience in gas-making, and is identified with gas-works in various parts of the country—a fact which constitutes him an authority of some weight. The title which he has used for his paper, "The Coming Revolution in the Manufacture of Gas," seems about to be realized by another party, but in a totally different manner from any plans suggested by the article in question. At present we cannot reveal the secret of the proposed new process, nor even speak of it as *un fait accompli*, for the thing is still in embryo, and further experiments are necessary to prove its worth. Still the experiments which have been tried, have, thus far, resulted successfully, and the inventor who conceived the idea entertains the most sanguine hopes of being able to reduce the cost of making gas more than one-half of that produced by the cheapest known process.

CEMENT FOR JOINTS OF PETROLEUM STILLS.—Take 6 pounds graphite; 3 pounds dry slaked lime; 8 pounds sulphate of baryta; and 3 pounds boiled linseed oil, and mix them thoroughly together. The solid materials must be reduced to a fine powder before being stirred among the linseed oil. If the above quantity of oil is not sufficient for making the cement sufficiently thin, add more until the proper consistency is obtained.

Linseed meal cake reduced to powder and mixed with water so as to make it into a paste, makes a good lute for stills which are not subjected to a temperature above 260° F.

No. 61 WANTING.—We will pay one dollar each for five copies of No. 61 of the AMERICAN GAS-LIGHT JOURNAL, on presentation at this office.

STORAGE OF PETROLEUM.

Meeting of the Committee on Ordinances of the Board of Aldermen.

The following advertisement in the daily papers has attracted much attention from those engaged in the petroleum trade in this city:

THE COMMITTEE ON ORDINANCES OF THE Board of Aldermen will meet on THURSDAY, the 6th instant, at 12 o'clock M., to consider the following Ordinance to regulate the Sale and Storage of Rock or Earth Oils, Petroleum, and Kerosene, Naphtha or Benzoin:

AN ORDINANCE

TO REGULATE THE SALE AND STORAGE OF ROCK OR EARTH OILS PETROLEUM AND KEROSENE, NAPHTHA, AND BENZOIN.

SECTION 1. No person or persons shall keep on storage, or for sale within the fire limits of the city of New York, any crude rock or earth oils, petroleum, kerosene, naphtha and benzoin, except as hereinafter provided.

SECTION 2. Crude rock or earth oils, coal oil and petroleum oil, may be stored or kept for sale in stores or buildings other than dwelling-houses, in quantities of not more than one barrel in any one building, provided it be kept in metallic packages.

SECTION 3. Manufacturers, refiners, or distillers of coal or rock oil, naphtha, or benzoin, may keep on store in their factories such quantities of oil, naphtha, or benzoin, as they desire, provided always that the said manufacture is carried on in a brick, stone, or fire-proof building or buildings, not nearer than fifty feet to any other building, and if in a frame building, not nearer than one hundred feet to any other building, and not to be located south of Fifty-second street.

SECTION 4. Refined petroleum, earth or rock oils, or coal oil and kerosene, for illuminating purposes, having a vaporing point of one hundred and forty degrees Fahrenheit, and upwards, and heavy paraffine oils, for lubricating purposes, may be kept on sale in stores or dwelling houses or other building, in unlimited quantities.

SECTION 5. Naphtha and benzoin may be kept on storage or for sale in quantities not to exceed ten gallons in any one building, the same to be kept in metallic packages or vessels.

SECTION 6. If any crude, rock, or earth oil, petroleum, kerosene, naphtha, or benzoin, or any refined coal or earth oils, petroleum, benzoin, or naphtha, shall be kept on sale or stored in larger quantities in any building or buildings within the fire-limits, than is especially provided for, and in violation of the provisions of this chapter, then all such excess may be seized or taken by any police officer of the said city, upon the order of the Mayor or a Captain of Police, or any of the Inspectors of Unsafe Buildings, and the same shall be stored or kept by such Mayor, Police Captain, or Inspector of Unsafe Buildings, upon whose order the same was seized, at some suitable place beyond the fire-limits, and sold at auction within ten days after such seizure; five days' notice of the time and place of such sale shall be given to the person or persons from whose possession the same was taken, and the proceeds, after deducting the expenses of conveyance, storage and sale, shall, within one week after the sale, be paid over by the person ordering the seizure, to the Treasurer of the Fire Department Fund, for the use and benefit of said fund.

All persons interested in the same will please appear before the committee, without further notice.

ALEX. FREAR,
PETER MITCHELL,
JOHN H. BRADY,
Committee on Ordinances.

Pursuant to the above notice, the Committee on Ordinances met at the City Hall on Thursday, the 6th instant, to consider the ordinance relative to the storage of petroleum and crude earth oils within the city limits. Mr Stansbury, of the Merchants' Insurance Company, said that, when the earth oils once got on fire, water only aggravated the flames, by spreading the oil over a larger surface. He considered that the section allowing one barrel of crude oil to be stored was unnecessary, inasmuch as the danger was just as great from one as from fifty barrels. Placing the petroleum in metallic vessels offered no additional security, as they were liable to explode. He proposed that sections three and four should be amended, by forbidding the manufacture of petroleum to be carried on in fire-proof buildings nearer than 100 feet from any other building; in wooden buildings, nearer than 200 feet. Also, to limit the quantity of refined petroleum on storage to ten barrels in any one depot. The practice of storing the oil on sidewalks was most dangerous, and should be forbidden, and empty barrels were more dangerous than full ones. Mr. Wm. Tilden said that naphtha was absolutely necessary in the manufacture of varnish; that he used thousands of gallons of it per month, and, if the ordinance went into effect, it would entirely stop his business. He denied that naphtha itself would explode. Mr. McCary thought that the vaporizing point ought to be made 110 degrees. In England and Ohio the point was 100 degrees. The oil would not explode at 100 degrees.

The Committee adjourned till the 7th inst., when

Messrs. Frear and Mitchell, of the Aldermanic Committee on Ordinances, gave a further hearing on the subject of an ordinance to regulate the storage of petroleum oil and the volatile substances evolved from the same, and which are known as naphtha, benzine, &c. A large number of interested parties were present.

Mr. Stebbins, from the firm of Scheiffilin, Bros. & Co., the largest dealers in petroleum in the city, first addressed the Committee. He scouted the idea prevailing that petroleum oil is explosive to a dangerous degree, but conceded that it is highly inflammable. While in the oil region last winter he found that he could not ignite the crude oil with a lighted cigar; and he and others failed to get up a bonfire with it on the evening of Washington's last birthday anniversary, till they had persevered as much to inflame it as they would have been obliged to do with hard wood. This fire did not burn free, and with a glowing flame, but emitted a dense volume of black smoke. At the fire in Williamsburgh, last summer, where his firm lost several hundred barrels of the oil, ignition was produced by a man stealthily smoking a pipe among it on a very hot day. After the fire it was found that the hoops of the barrels laid in a regularity of position that conclusively showed they had dropped off, and that none of the barrels had exploded. When brought into contact with heat, the crude oil readily generated an explosive vapor. This fact, and the danger arising in consequence, it took some time to fully understand and guard against; the trade in the article, although great, even at present, being yet in its infancy. Improvements in the refining processes led to more security in storing and transporting it, and the finding of profitable uses for the volatile portions, when extracted, had also gone far toward lessening the danger. He thought the refinement of the crude oil should be prohibited in the city, and commended the course of the insurance companies in urging regulations of safety for the storage of the vaporizing oils. He believed 110 degrees would be a high enough standard for the refined article.

Mr. Cunningham, of the firm of J. H. Brundage & Co., agreed with the views of the previous speaker. He also expressed the belief that the fixing of an unusually high standard of vaporization would drive a great trade away from the city—as the saltpetre trade had been driven away to Boston.

Mr. Curry said the insurance companies considered refined oil dangerous, and made the price of their risk accordingly.

Mr. Cameron, a dealer, said there was a great difference between the crude and the refined oils. The former was very dangerous, but the latter was dangerous only when brought into contact with heat of a certain degree. He thought 100 degrees was the point of safety for refined oil. He mentioned turpentine, alcohol, brandies, &c., as articles just as dangerous, and some of them more so, than refined earth oil, and which are not restricted by any legislative action in regard to the matter of storage.

Mr. Cunningham said the earth oil would not evaporate to an explosive point till it was boiled. It would not evaporate of itself. Turpentine and other articles of a like character were constantly evaporating, no matter what the temperature might be.

One man, a dealer, stated his belief that there were not more than 2,000 barrels of petroleum oil in the city, while he knew there were over 50,000 barrels of whiskey stored down town. He thought the standard of 140 degrees, first talked of, would do away with the petroleum trade in this city.

Mr. Cunningham believed the product of that grade of the oil would be so very small as to run up the price of kerosene to a degree prohibiting its general use.

Alderman Mitchell remarked that whiskey would not vaporize through a barrel, but he believed petroleum would.

Mr. Heild said the insurance companies had a remedy in their own hands—they could refuse to insure the oil at all, or only at very high rates. He thought refined oil was not safe at a less degree of evaporation than 125. He had found that the oil exuded from a barrel in his cellar, so as to stain the floor. On standing the barrel upon a large old-fashioned pewter platter, moisture gathered on the dish.

Alderman Mitchell was informed that refined oils would vaporize to an explosive point at less than 100 degrees of heat.

A tester of the oil was here introduced and tried. The inventor placed a small quantity of refined oil in the cup of the apparatus, and fixed a light in the chamber beneath to heat it. The oil would not burn on applying a lighted match to it, but it vaporized at 90 degrees, and burned at 110.

The dealers said there were several machines patented for indicating the vaporizing point, and they all varied somewhat. The test just made was not reliable, because the oil was confined in small quantity.

Alderman Mitchell said it was a true scientific test. If the oil were placed in a large open vessel, the atmosphere would come into play as a cooling agent. The tests just used served to demonstrate the chief point they desired to attain, which was the exact vaporizing point. On storing the oil it necessarily was confined, and it was desired to know at what point of heat it would vaporize and explode when kept close.

Chief Engineer Decker and a friend with him—a fireman—both said that it had been found that burning petroleum could not be controlled by water, but that water helped to extend the flame.

A German gentleman present remarked that steam had been found to be an effective agent to subdue petroleum flame.

Mr. J. J. Douglas addressed the Committee in behalf of the insurers, taking the ground that petroleum had been found to be very dangerous, and, therefore, that it ought to have a strong safeguard of law thrown around it.

A gentleman here entered the room and read a note he had received that morning, announcing the raising of his rates of insurance because petroleum was being stored next door to him. The rise would increase his expenses about $2,000 per annum.

Several changes and modifications of the ordinance under consideration were suggested. The Committee made note of all of them, promising to draft a new ordinance, that would take just cognizance of all the interests concerned, for review at the next meeting. Adjourned for one week.

THE STRIKE OF THE WORKMEN OF THE MANHATTAN GAS COMPANY.—In our last issue we published an account of a strike at the works of the Manhattan Gas-Works. The demands of the workmen for an increase of wages were met by the Company with a spirit of liberality which should have been appreciated. But so far from this being the case, the laborers, including the stokers and other workmen, formed an organization, or trade union, having for its object the rejection of the standard of wages, and the rejection from employment of every man who would not join the association and conform to its rules. The majority of the hands belonging to the association declared that they would not work with those who were not members of the same. The officers of the Company very properly think that the tacit adoption of such a rule would deprive them of all moral control of the works. Consequently they have determined to resist the demands of the association, and have discharged a number of workmen belonging to it, and threaten immediately to remove some one hundred and forty more if the association does not rescind some of their arbitrary rules. The difficulty seemed so great a day or two since that apprehensions of a riot were felt by many, but we hope no such demonstrations may be made.

The following is the statement of the firemen, formerly employed in the Manhattan Gas-Works, written to the editor of the *Herald*:

On account of the great increase in the prices of the necessaries of life, the firemen connected with the works of the Manhattan Gas-Light Works respectfully, on the 24th day of October last, petitioned the company for an advance of wages from one dollar and fifty cents per day to two dollars.

On the 28th of the same month the company, through their superintendent, William Combs, refused to grant the petition of the workmen, whereupon the men, in a body, refused to continue work, formed in a procession, and proceeded to let it be known to the public and workingmen generally that they were on a strike for just wages.

The men, in the afternoon of that day, in a body, came to the yard, where they were addressed by the President of the Company, Mr. Charles Roome, who most unequivocally assured the men, on his word, that they should, if they continued at work as usual, receive one dollar and seventy-five cents per day wages, and also constant employment as long as the men were willing. This the workmen consented to, and expressed a readiness to return to work provided the company would at once discharge three certain foremen who had, for reasons of their own, encouraged the men to believe that if they struck they would readily get their full demands.

The foremen spoken of were discharged by the company, and the whole matter thus remained until Wednesday last, November 12, when at noon of that day the old hands were astonished to see a large body of policemen and some two hundred Germans enter the

yard, the latter making preparations to commence work. At the same time the superintendent of the company appeared and peremptorily ordered the old hands to leave the yard, which they, as law-abiding citizens, at once did, though many were driven to that extent by the policemen that they were barely able to obtain their coats before leaving.

The men then in an orderly way formed in procession and marched through the streets of the city, and though they were unjustly attacked and driven from street to street by a large body of police, who were sent after them on false representations of the men's intentions made to the police headquarters by the company, the men studiously avoided all conflict and endeavored to keep entirely within the letter of the law.

Most of the men have worked for this company for a period of eight or nine years, and have faithfully performed their duties, and now, on the approach of a trying winter, with provisions and fuel extremely high, and in most cases with large families dependent on them for support, they are driven out from work which they were able and willing to do, and that at prices (mark the fact) offered by the company, in apparent good faith, on the 28th day of October.

The men have therefore, in self-defence and for mutual protection, formed themselves into a society. We are jealous of our reputations, and as several gross misstatements of the objects of the association have been inserted in the public prints by persons influenced by the officers of the company, we have, in sheer justice to ourselves, been prompted in this manner to lay the whole truth of the matter before a discerning public.

JAMES CAMIER,
STEPHEN MADDEN,
PETER COYNE,
JEREMIAH QUILL,
HUGH O'DONNELL.

PHILADELPHIA, PA.—We are informed that prior to the recent municipal election in Philadelphia, the democrats had a plan cut and dried, by which, if they were successful in electing a majority to the city councils, Mr. John C. Cresson, the present engineer of the gas-works, was to have been removed, and Mr. Samuel R. Brick substituted in his place. The election, however, went against the democrats, and consequently Mr. Cresson retains the position he has so long and acceptably filled. What a commentary on municipal gas management! that a man's political opinions render him eligible or ineligible for the position of gas-engineer! Both of these gentlemen are well qualified for the position, however, but why politics should be the touchstone we cannot comprehend

WHAT SHOULD BE TAXED.

GAS-TAR.—The product of gas manufactures should be taxed in cities, where it is valuable for paint, roofing, dyeing, &c. The country gas-works have no market for it, and are obliged to let it run waste into the rivers. It should be exempt there, but not in cities.

COKE.—Also a product of gas manufacture, and is sold at from $3 to $3.50 per chaldron—nearly ten cents per bushel. It is true that coal pays a nominal duty of three cents per ton, but after yielding its gas, there is no reason why coke, which is then valuable as a fuel, should not pay a separate tax of five cents per bushel, coupled with which should be a prohibition on its sale at over ten cents per bushel.

CLAIM AGENTS.—A tax of $50 at least should be substituted for the present nominal tax of $10 per annum. Every claim agent of any responsibility can afford to pay $50 to $100 per annum.

SUTLERS.—No tax is now charged them, unless it be the license charged to pedlars. Sutlers make from 100 to 500 per cent. profit, and should pay $50 to $100 per annum tax.

A NOBLE EXAMPLE.—Among those drafted in Lebanon county, Pa., the only man was the proprietor of the Cornwall Furnace, Mr. Robert Coleman. Not being able to go himself, he assembled his workmen and asked whether any of them would be willing to go in lieu of himself, providing he was liberally paid. After some hesitation, one of the men present informed Mr. Coleman that he was willing to go as a substitute. The man was closely questioned and fully informed of the danger to which he subjected himself, but he frankly declared that he was willing to go, on which Mr. Coleman presented him with a check for $3,000, and guaranteed, further, that in the absence of the substitute his family was to receive a sum each week equal to that which he earned as a laborer. In addition to this sum, Mr. Coleman stipulated to pay to the wife of the man thus acting as a substitute, the sum of $3,000, in case he should be killed in battle or die by any of the diseases incident to the camp. This is a noble example of liberality.

[The foregoing item, which we clip from the *Scientific American*, has been going the rounds of the press for two or three weeks. We do not like to spoil a pretty story, but we have the best authority for saying that the whole thing is a *canard*. Mr. Coleman was *not* drafted, consequently the touching exhibition of liberality never took place.—ED.]

NEW YORK, N. Y.—This old and poverty-stricken gas-light company is stated, unofficially, to have just now quietly declared *an extra dividend of one hundred per cent. in cash, and a stock dividend of thirty-three and one-third per cent.* Poor fellows! No wonder the London *Journal of Gas-Lighting* comes to its relief against the attacks of the AMERICAN GAS-LIGHT JOURNAL. The motto of the London *Journal* in reference to these injured American gas companies, is like that of our friend Col. JAMES MONROE, when MARCY, the Secretary of War, was "firing upon the rear" of General SCOTT, while in Mexico, in 1848. MARCY met MONROE on Pennsylvania avenue, and extended his hand to him. MONROE, like a gallant fellow and true Virginian as he is, placed his hands behind him, and said, "No, sir; you have attacked General SCOTT while absent and unable to defend himself. I am his friend, present, sir, and his champion, absent, sir, and I'll be d—d if I shake hands with you, sir, if you *are* the Secretary of War." The only difference is, that Bull, three thousand miles off, attempts the championship of the companies here, and quite able to take care of themselves. The next time our friend CHARLES ROOME dines with us, we will drink to the British champion. We will.

MANHATTAN, N. Y.—This company has issued its bills for September, and although "Government Tax" is printed on its face, no charge is carried out, so that the attempt to fasten it on the consumers may be said to be abandoned. The Manhattan is, therefore, received again into our full communion.

ILLEGAL DETENTION OF CREWS.—The survivors of the *Cumberland* and *Congress* are entitled by law to be discharged from the service. The Secretary of the Navy will order the immediate discharge of any jacktars who have not voluntarily remained or re-enlisted since the destruction of those ships.

IRON FOUNDRIES.

BERGEN IRON WORKS,
Established 1833.
R. A. BRICK, Manufacturer of CAST IRON WATER and GAS-PIPES RETORTS, PIPES, &c., always on hand. Office, 109 Leonard Street, New York.

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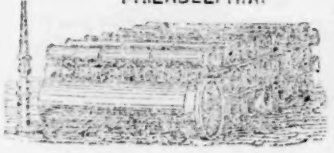

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FLUID FOR GAS-METERS.—The undersigned is prepared to furnish the Glycerine Meter Fluid in quantities to suit purchasers. *It does not evaporate, can be made to stand any degree of cold liable to occur in this country or in Canada, and does not corrode the metals of the meter. It has been in use successfully for the last three years.*

For particulars, references, &c., address the manufacturer, HENRY BOWER,
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GAS THERMOMETERS FOR ascertaining and regulating the temperature of the gas while passing through the purifiers into the station meters. For sale at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

WOODEN PURIFYING TRAYS.

PATENT CONICALLY SLOTTED SOLID WOOD TRAYS FOR GAS Purifiers. Patented by Wm. Combe.

CAUTION TO GAS MANUFACTURERS.

Letters Patent having been issued to Mr. N. O. Hawxhurst, assignee of Wm. Combe all persons are cautioned against purchasing said trays of any party except the subscriber, who is the only authorized agent for their manufacture and sale.

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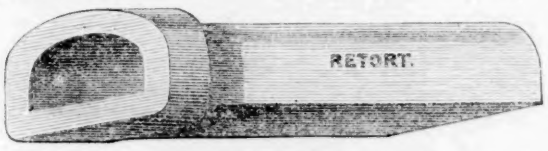
CONICALLY SLOTTED SOLID Wood Trays for Gas-Purifiers.—Admitted to be the best, cheapest, and most durable seives for gas-purifiers ever used.

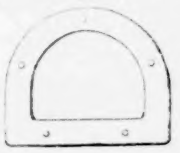
Secured by Letters Patent of the United States, both for the machinery used in the manufacture, and for the seive itself.

For sale on reasonable terms to Gas-Light Companies or Agents, on application, by letter, to the patentee, RICHARD G. HUNT,
631 Fourth st., near Avenue C,
New York City.

N. B.—All persons are warned against purchasing these seives of others who falsely pretend to have patents for them. Suits will be commenced immediately against all persons infringing my patents by using or making wooden sieves, but those who hereafter purchase from me can buy their seives cheap and will not be troubled by me on account of former purchases. R. G. H.

COWEN'S PATENT FIRE-CLAY RETORTS.





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Have always been, and are still, the most extensive manufacturers of FIRE-CLAY RETORTS in the United Kingdom, and were the only parties to whom a Prize Medal was awarded at the Great Exhibition, in London, 1851, for

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J. C. & CO. make Fire-Clay Retorts of all shapes and dimensions, and to fit existing mouth-pieces.

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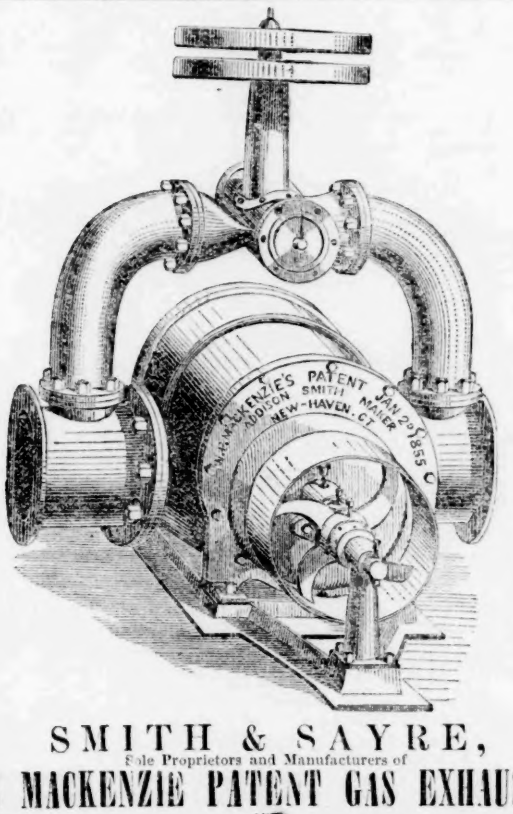
N. B.—J. C & CO.'S RETORTS are well adapted for small Gas-Works, as they can be used without an Exhauster.



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Sole Proprietors and Manufacturers of

THE MACKENZIE PATENT GAS EXHAUSTER AND PATENT COMPENSATOR.

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. uel. Address SMITH & SAYRE, 458 Broadway, New York.

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AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Four Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

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He refers to most of the principal Gas-Works in the West, and upwards of twenty years extensive experience in Gas-Works.

A CIVIL ENGINEER, HAVING A number of years experience in the manufacturing of COAL-GAS, is desirous of obtaining charge of some department in a first-class Gas-Works, or charge of the same in the country. Salary not the principal object. Best of reference. All communications will receive a prompt attention. Address
R. M. B.,
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TO GAS COMPANIES.—A COMPETent Engineer can be engaged on favorable terms, to alter Rosin, or make repairs or extensions to Coal Works. Satisfactory reference for capability. Address
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Station C, New York City.

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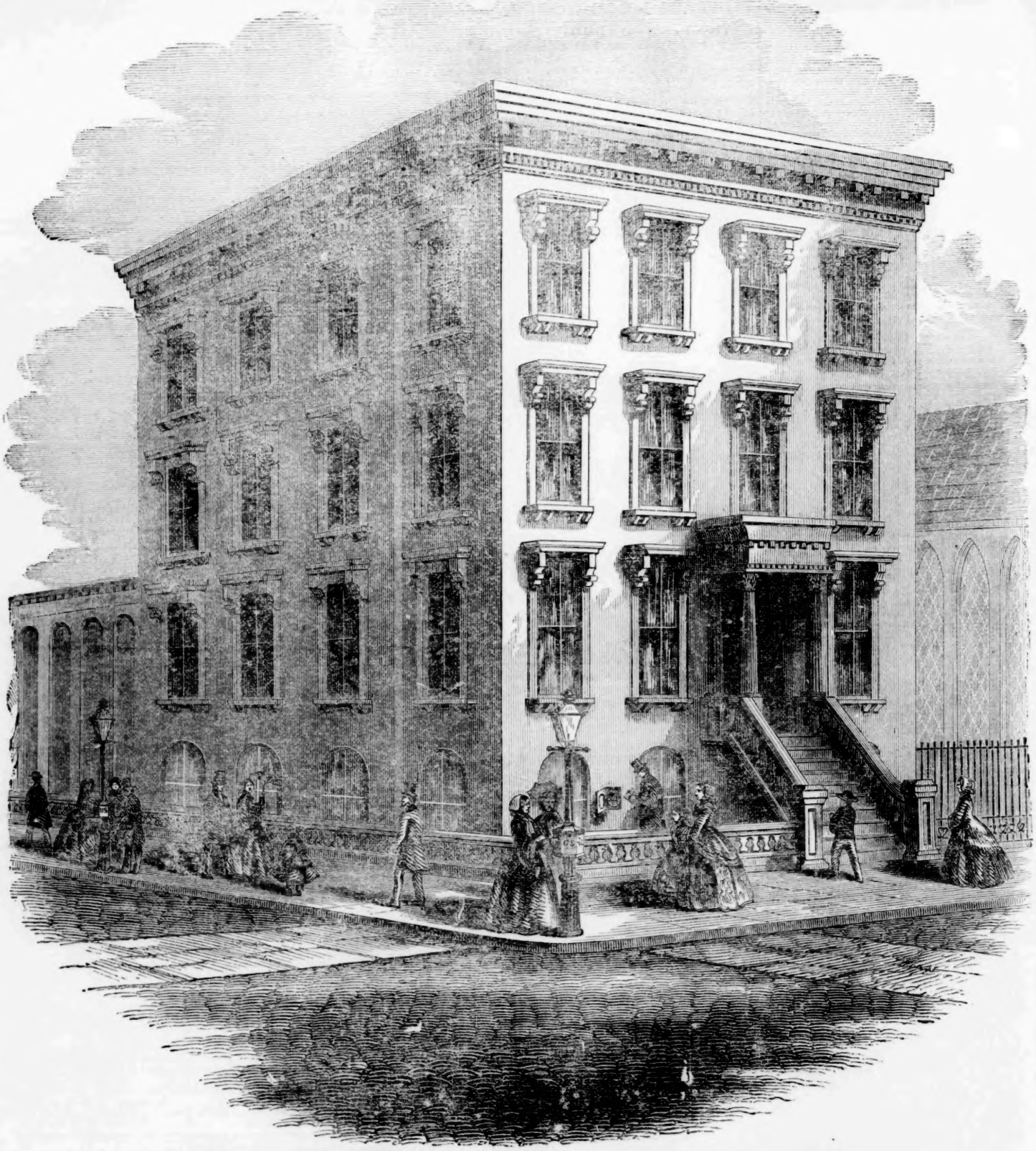
Gratis and post free, "The Inventor's Manual," also a pamphlet, "L'Obtention de Patentes Anglaises," 500 Mechanical Movements; the first part of Kinematics, or the Transformation of Motion, by Joseph Willcock, C. E., Mem. Soc. of Eng. May be had at the above address, and of any bookseller. Price 2s. 6d

The second part is approaching completion and will shortly be announced.

"NEW BOOKS." ANY OF OUR Readers who may require books on the subject of Gas-Light, Heat, Water, Sewerage, or other scientific matters, can be promptly supplied by addressing the Publisher of The AMERICAN GAS-LIGHT JOURNAL, No. 58 Liberty st., New York.



THE TWO GREAT PATENTS OF THE DAY.

1.—Improved Mode of Setting Gas-Meters in the Walls of Buildings.
2.—Cast-Iron Mail-Stations for Public Lamp-Posts.

Adopted by the UNITED STATES GOVERNMENT for the Principal Cities.

ALBERT POTTS, Philadelphia, Patentee.

By the FIRST IMPROVEMENT the Meters may be inspected at any time from without, by the agents of the Gas-Company having keys for that purpose. Thus burglars need no longer gain admittance to dwellings under pretense of examining the meters, while they, in fact, examine the fastenings. The meter-box, being neatly and securely imbedded in the front wall, the meter is protected against frost by means of a thick pad on the back of the door. It has been satisfactorily tested in long continued severe weather and found to be eminently successful.

The SECOND IMPROVEMENT speaks for itself. The cities of New York and Philadelphia are already supplied with these boxes, and the convenience to the citizens and increase of revenue to the Post Office Department are most marked. Always in sight, securely fastened to the most public objects, protected by light, day and night, they have become the most popular of all modern improvements and will be immediately adopted throughout the country.

Both of these improvements are to be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, New-York City. For further information address the Proprietor of this JOURNAL, who is authorised to contract for the use of both Improvements, or

ALBERT POTTS, Philadelphia.

POTTS' REVOLVING SIGNAL LIGHTS,

PATENTED SEPTEMBER 8, 1857.

Mr. ALBERT POTTS, the well known Inventor of the LAMP POST LETTER BOXES, which have been adopted by the Post Office Department for the large cities of the United States—and also of the GAS METER BOX, to be set in the front walls of houses, thus doing away with visits from Gas Inspectors, or burglars in gas-clothing, has lately brought forward a third Invention, which in point of importance and world-wide usefulness, surpasses the others entirely.

These SIGNAL LIGHTS are intended for use on Vessels propelled by Steam, and those exclusively. They specially indicate the presence of a Steamer, and by their use, there will be less likelihood of mistakes and consequent collision than at present. They are also intended for SIGNALLING AT NIGHT, and can be used for that purpose UNDER ANY CODE of SIGNALS NOW ARRANGED FOR FLAGS.

This Improvement in Lights for Steam Vessels, consists in having the Lanterns containing the colored lights, connected by means of a series of cogged gearing with some convenient part of the Engine or Machinery, so as to cause them to have a revolving motion around their axis. On side wheel Steamers, the Lanterns should be placed directly over the wheel houses, and the power, or motion to turn them, may then be very conveniently obtained from the paddle wheel shaft. On Propellers, the Lanterns should be placed on each side of the Pilot House, or hurricane deck, and the rotary motion derived from any convenient or suitable part of the Engine or Propeller Shaft. Each Lantern is supported on the end of movable cranes, so that their relative positions may be changed and properly adjusted to suit the view of observers on either side of the vessel at the time of signalling.

The Lanterns to be used in this improvement may be constructed for Burning Oils, Fluids, Gas, or any of the known modes of illumination and should be furnished with one or more lenses and reflectors, so as to concentrate the rays of light, and project them over the horizon with the greatest intensity. The lenses for this purpose should be made with colored glass, viz., Red and Green, and the position of the respective Lanterns, according to the colored Lenses therein, must be placed on the sides of the vessel so as to answer to the requirements of Rules and Regulations made and published by the Supervising Inspectors of Steamboats, agreeably to the Act of Congress of the United States in such cases made and provided. That is to say—by said Regulation—the Lantern having the green lenses for producing the Green Colored Light, must be placed on the starboard side of the vessel, and the other Lantern producing the Red Light, to be placed on the port side thereof. In pursuance, also, of the aforesaid Rules and Regulations, there is to be found in board and behind each Lantern, a screen to answer the purposes therein mentioned.

The cogged gearing, by which the Lanterns are connected with the Engine or paddle wheel shaft and thereby caused to revolve when the Engine is in motion, is so arranged that the connection may be readily shipped or unshipped, and the Lanterns made stationary or otherwise, at the pleasure of the Pilot, or those whose duty it may be to operate and attend to the same. The cranes on which the Lanterns are placed, are also rigged so as to be readily turned horizontally from one position to another, so as to present one or both Lights to the view of observers when laying athwart ships at the time of signalling.

On the Use and Application of the Improvement for Night Signals.

When the vessel is under weigh or going ahead in its course, the Lanterns are to be placed directly athwart-ships, so that such colored Light therein will then have the position and place prescribed by Rule Seventh of the afore said Supervising Inspectors of Steam Boats, and with the screens behind them, as above described, will then answer all the intents and purposes for which the colored Lights are thus required to be used, as illustrated in the several diagrams published by said Inspectors for the working of a system of Colored Lights. The Lights in this case, according to the color seen by the observer, indicate the course or direction of the vessel when they are carried. When the Lanterns with the colored lights therein, are made to revolve around on their axis, as proposed in this improvement, in addition to the signal above, another and as we believe, very important and useful signal is thus formed, indicating that the vessel, whereon it is carried is a Steamer. In dark foggy nights, it is found by experience, to be somewhat of a difficult task to distinguish sailing vessels from Steamers and Propellers, especially when the latter are rigged, and carry a piece of sail. When Steamers meet "head and head," it is the duty of each to pass to the right, or, on the larboard side of the other. Whereas, when a steamer meets a sailing vessel, the former must give way and allow the latter to pursue its course. Hence, to carry out the regulations of the said Steamboat Inspectors and prevent collisions, it is important to have some infallible sign, whereby the character of the vessel may be readily seen and determined. Several very fatal collisions have recently taken place through mistakes of this kind.

On Signals for Speed and Distance.

The gearing of the Lanterns with the paddle wheel or propeller shaft may be so arranged as to be an index of their speed. A very good proportion, would probably be to make the Lanterns turn about one third as fast as said shaft. Hence when the speed of the vessel is previously known, when making a certain number of revolutions of the paddle or propeller, it becomes an easy task for a observing the time with which the Lanterns thereon may be turning to approximate to the speed with which the said vessel is moving at the time of observation. Again, as the arcs described by the rays of light from each lantern, as they revolve around on their axis, is greater in proportion to the distance from said lantern, so will the time in which said rays move over any given space be less in the same proportion. Hence, when the lights are very remote, or far off, from the observer, the duration of each column or cylinder, of rays from each lamp would pass the eye of the observer, in a short space of time or with great velocity. Whereas, at a nearer point of observation, the time of its passage would be considerably lengthened or the motion thereof apparently much slower. From these facts, we believe the improvement is susceptible of indicating, in an approximate manner, the speed and distance of vessels whereon the revolving lights may be used.

On the Application of the Improvement for Marine Telegraphic Purposes.

The Revolving Lights can be readily applied to the general purposes of Marine Signalling at night, as follows: In order to show this application, we have adopted the Numbers as given in Roger's Code of Marine Day Signals, believing that work to be somewhat of a standard in matters of this kind. Instead of the flags used in the above code, for day signals, to indicate the combinations of two or more letters of the Alphabet, which combination is referable to certain numbers indicative of the words or sentences telegraphed, we propose to perform the same operation at night, by means of the two revolving colored lights, so as to indicate the numbers directly to which the intended words or sentences to be telegraphed are referable. Thus, whether the vessel to be signalled is ahead, astern, or abeam, the position of the two colored lights must be so adjusted, by means of the moveable cranes, whereon said lanterns or lights are fixed, that the two lights may be fully made visible to the observer. When both lights are thrown into this position, stopping the motion of the lanterns may be the signal for calling attention, or a rocket fired off, or the steam whistle blown, would answer the same purpose. Now, in order to represent the ten numerals, we propose to indicate them by the respective motions of the two colored lights, as follows:

RED LIGHT.				GREEN LIGHT.			
One Red, Represents Number			1.	Two Green, Represents Number			2
Three	do.	do.	3.	Four	do.	do.	4.
Five	do.	do.	5.	Six	do.	do	6.
Seven	do.	do.	7.	Eight	do.	do.	8.
Nine	do.	do.	9.	One	do.	do.	0.

In the above arrangement, it will be seen that all the odd numbers are made by the Red Light, and the even numbers by the Green Light. In order to indicate the repeat of the last number, once or more times, or for other special purposes, which may hereafter be found useful and necessary, an even number of lights may be shown by the Red, and an odd number by the Green. It will be understood that when the Lanterns are made with three lenses in them, the numerals as above arranged are formed by the number of times a new light or lense is presented to the observer. Thus to indicate the number 3, the Red Light or Lantern would make one entire revolution; and to make the number 6, the Lantern carrying the Green Light would make two revolutions and so on with the other numbers. When a symbol is made, the motion of the Lantern is to be suspended for a short time, and when a number expressing a sentence is formed, the lantern may be stopped for a longer period, or some one of the special signals above referred to, may be used for this purpose.

To show the application of this improvement as above mentioned, whereby these Lights can be used as readily for Night Signals, as Flags are used for Day Signals by the author of Roger's Code, we shall use the sign O colored red or green, according to the light used, to show the number of movements performed by the respective lights in order to represent any desired number of said code, suitable for the required purpose.

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O,	
O, O, O, O, O, O, O.	
	O, O.
	O. O.

The above would represent the number 5722, and by reference to said Roger's Code, would be found to stand before the sentence:

"WILL YOU SHOW THE NUMBER THAT REPRESENTS YOUR NAME?"

RED LIGHT.	GREEN LIGHT.
O.	
O. O, O, O, O.	
O, O, O, O, O, O, O.	
	O, O.

Here the number expressed is 1572, and per the same Code, stands for

"WHERE ARE YOU BOUND?"

RED LIGHT.	GREEN LIGHT
O.	
O, O, O, O, O, O, O, O, O.	
O O	
O, O, O, O, O, O, O, O	

The number thus expressed is 1728, and per said Code is

"WHAT IS YOUR CARGO?"

RED LIGHT.	GREEN LIGHT.
O, O O, O, O.	
	O, O. O, O, O, O.
	O.
O O O	

Here the number expressed is 5663, and stands for

"HAVE YOU ANY NEWS?"

(RED LIGHT.)

Fig. 2

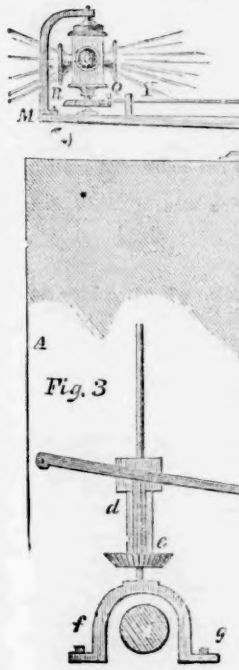


Fig. 3

(GREEN LIGHT)

Fig. 1

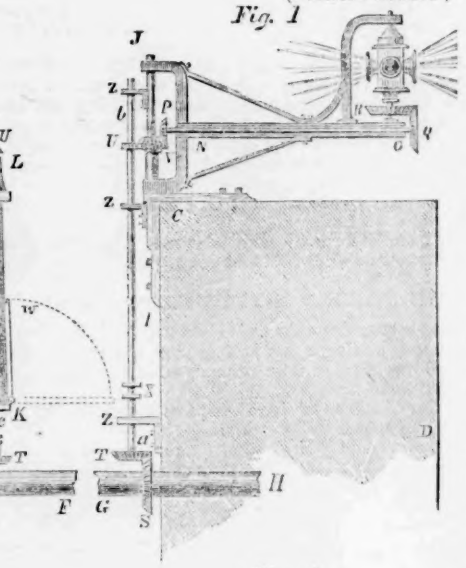


Fig. 4

MECHANICAL CONSTRUCTION.

In our engravings, Figs 1 and 2, represent Vertical Sections through the wheel-house. In them E F and G H represent portions of the main Shaft. In Fig. 1, I J is a stout Iron or Wooden post, fastened against the side of the wheel-house, directly over the main shaft. On the upper part of this post, is fitted the moveable arm or crane N O, to the main shaft is fitted the bevel wheel S, and to the lower end of the rod a b, is fitted a corresponding wheel T. U is a small pinion on a b, which gears with the spur wheel, V, which in turns gives motion to the wheels, P and Q, and so revolves the lamp R. It will be seen that a Rotary motion is given to the lamp, when the main shaft is in motion and a b connected.

It can be disconnected by a lever, acting between the bosses X, which will elevate the rod in the guides Z Z Z.

Fig 2 is another arrangement, for the same purpose. In this, K L represent a hollow Shaft, on which is firmly fastened, the arm L M, on which is the lantern. The hollow post is secured to the wheel-house by the straps K and B, and it can turn freely in them, the other parts being the same in them as in fig. 1

The lever K W, when drawn down, will turn the frame in any required position around the Shaft c U. In fig. 1, the arm or crane N O, may be operated by cords from the wheel house, but in this device, the rod c U, does not lift up as in fig. 1, but in its place, the lower end is made square, and on it slides the short tube, d E shown in fig. 3. The lower end of the rod turns on a bridge, f g, spanning the main shaft. On the upper end of the tube, d e, a lever is attached by means of boxes and collars as shown in fig. 4. This lever when raised carries with it the beveled wheel T, thus disconnecting the gearing apparatus.

ALBERT POTTS, Patentee,
PHILADELPHIA, Pa.

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No. 39 Nassau Street, New York, opposite the Post-office.

PATENT BITUMINIZED PIPES,

For the Conveyance of Water, Gas, and Drainage.

This important invention, patented by Mr. Charles Newbold, and now for the first time introduced to the public, may confidently be stated to be one of the greatest interest and commercial value, as the Patent Bituminized Pipes possess all the qualities necessary for the conveyance of Water, Gas, Sewage, Mine-Pumps, &c., viz.: great strength, great durability, and inoxidability, with the immense advantage of being about *one fifth* the weight of iron pipes, and about 35 per cent. cheaper; whilst, compared with lead pipes, the Bituminized Pipes are only about *one fourth* their price, without the possibility of the formation of the oxide and carbonate of lead, so dangerous for every purpose. They will stand 150 degrees of Heat, and after many trials it has been satisfactorily proved that rats or vermin will not touch them. They also withstand the action of all acids and salts

Iron pipes are at present frequently covered with a coating of bitumen or coal tar before they are laid down; but the adherence of this coating to the metal being very imperfect, on account of vibration and the difference of expansion, this preservation is insufficient, besides being exposed to a number of influences which neutralize its efficacy—galvanic currents materially assist the formation of oxides and deposits, which cause the obstruction and eventually the destruction of metallic pipes.

The Patent Bituminized Pipes are neutral, non-conductors of electricity, and consequently are not exposed to any of the deteriorating influences mentioned above. The process of manufacture of these Pipes consist in causing a roll of paper to pass through a reservoir of melted bitumen, after which it is tightly coiled around a mandril to any required thickness; and thus, when hardened, a tube is formed of perfect texture, great hardness, and enormous strength. These Pipes are proved, by hydraulic pressure, to resist a pressure of 220 lbs. to the square inch, equal to 506 feet head of water, which is more than double the altitude of the highest reservoir. The bituminous composition which unites and covers these Pipes is so well known as an excellent preservative, that it will be unnecessary to demonstrate that, when laid underground, the durability of the Patent Bituminized Pipes may be considered as unlimited. The Pipes are made in lengths of seven feet, and are connected by socket joints of the same material as the Pipes; or they can be fitted with iron flanged sockets, screwed together in a most simple and inexpensive manner.

For Gas these Pipes are invaluable; the Gas-lining which we insert effectualy resists the action of Gas, and being non-conductors, there can be no condensation in them, and the joints made with the Patent Cement are so strong as to entirely prevent Leakage.

The cost of laying the Pipe is also small, compared with those of iron, and can be done by mere laborers. The Bituminized Pipes have been in use the last three years, for the conveyance of gas and have been ascertained to be as perfect now as when first laid down.

DIRECTIONS FOR JOINING THE PATENT BITUMINIZED PIPES.

Pack the pipes level in the ordinary way; slip the collar over one of the pipes; draw the ends close together and warm them by putting a hot iron between them; then press them together so as to make them adhere; take a piece of iron wire netting, about half an inch in the mesh, a little narrower than the length of the collar, and long enough to wrap once round the pipe, spread the collar over it and the joining; close the ends with clay; pour the melted cement into the manhole of the collar, and fill up the interior space; then remove the clay and the joint is finished.

It is necessary to leave a small vent hole in the clay at each end of the collar to allow the air to escape as the cement is poured in, that there may be no flaws or air bubles in it when cold. If in cooling the cement settles in the manhole, fill up again.

N. B.—The cement should be broken into small pieces and melted in a pot as you do lead, at a low temperature, until it is dissolved; it must be stirred while melting; then take it off and keep stiring it as it cools until it becomes nearly as liquid as water; then pour quickly.

All Orders should be addressed to

THE AMERICAN BITUMINIZED PIPE COMPANY,

OFFICE 24 WATER STREET, BOSTON, MASS.,

J. McGEARY, AGENT;

or to FREDERICK W. BOND,

SOLE AGENT FOR NEW YORK,

58 LIBERTY STREET, (Between Broadway and Nassau Streets,) **NEW YORK.**

Cement for Joining, For Sale as above.